

Public Notice



Applicant:
City of Cleveland

Date:
Published: Oct. 18, 2000
Expires: Nov. 17, 2000

**U.S. Army Corps
of Engineers**

In Reply Refer To:
Buffalo District CELRB-CO-R RE: 98-494-0112(1) **Section:** OH 404

Application for Permit under Authority of
Section 404 of the Clean Water Act (33 U.S.C. 1344).

The City of Cleveland, Department of Port Control, 5300 Riverside Drive, Cleveland, Ohio 44135-3193 has applied for a Department of the Army permit to fill 87.85 acres of wetlands and 7900 linear feet of existing streams, at Cleveland Hopkins International Airport. The purpose of the project is to expand and modernize the airport to comply with current Federal Aviation Administration safety standards and accommodate larger aircraft typically used in overseas travel.

Specific activities include:

- (1) Fill 2500 linear feet of unnamed tributaries to Abram Creek, collectively referred to as the "South 40 Tributaries";
- (2) Fill 5400 linear feet of Abram Creek, to include a 10-foot diameter culvert pipe to conduct the flow of Abram Creek under the fill;
- (3) Close existing Runway 18/36;
- (4) Shift existing Runway 5R/23L 960 feet to the southwest, in order to eliminate its intersection with existing Runway 10/28, and extend the runway by 2250 feet, to a total length of 11,250 feet, resulting in impacts to 26.10 acres of wetlands;
- (5) Convert existing Runway 5L/23R to a taxiway, and construct a new 9000-foot Runway 5L/23R, parallel to Runway 5R/23L and separated from it by 1241 feet, resulting in impacts to 31.18 acres of wetlands;
- (6) Construct a 30-acre stormwater detention basin between the new and extended runways, resulting in impacts to 30.57 acres of wetlands.

A wetland delineation prepared by Environment and Archaeology, and subsequently approved by the Corps, identified 38 individual wetlands, totalling 103.78 acres in the delineation study area. 94.40 acres of wetlands are located on the approximately 1600-acre Airport property. Of the 87.85 acres of wetlands to be impacted approximately 54.74 acres are forested; 15.31 acres are scrub-shrub; 17.18 acres are

emergent; and 0.62 acre are open water.

As mitigation for the permanent loss of 87.85 acres of wetlands, the applicant has proposed to restore approximately 265 acres of wetlands. As mitigation for the permanent loss of 7900 linear feet of existing streams, the applicant has proposed to restore 13,500 linear feet of streams and preserve an additional 7707 linear feet of streams. Mitigation activities will occur at six separate locations, as follows:

- (a) Preservation of 3000 linear feet of Elk Creek (a tributary to the West Branch Black River), near Parsons Road, in LaGrange and Carlisle Townships, Lorain County, Ohio, to be purchased and donated to Lorain County Metroparks (LCMP);
- (b) Preservation of 4707 linear feet of Spring Brook (a tributary to Bass Lake and the Chagrin River), near Wilson Mills Road, in Munson Township, Geauga County, Ohio, to be purchased and donated to the Geauga County Park District;
- (c) Restoration of 1500 linear feet of Woodiebrook Creek (a tributary to the Chagrin River), on 8.5 acres of land currently owned by the Chagrin River Land Conservancy, at Woodiebrook Road, Munson Township, Geauga County, Ohio;
- (d) Restoration of approximately 12,000 feet of Doan Brook (a tributary to Lake Erie) within Rockefeller and Wade Parks, in the City of Cleveland, Cuyahoga County, Ohio;
- (e) Restoration of approximately 185 acres of wetlands on LCMP property located at Royalton Road (State Route 82) in Columbia Township, Lorain County, Ohio;
- (f) Restoration of approximately 80 acres of wetlands on LCMP property located at Crook Road, near the Village of Grafton, in Grafton and Lagrange Townships, Lorain County, Ohio.

Location and details of the above described work are shown on the attached maps and drawings.

Copies of this notice and the complete permit application, containing further details of the above-described activities, is available for public inspection during normal business hours at the following locations:

Cleveland Public Library
Main Branch
325 Superior Avenue
Cleveland, OH 44114
(216) 623-2856

Cleveland Public Library
Martin Luther King Branch
1962 Stokes Blvd.
Cleveland, OH 44106
(216) 623-2856

Cleveland Public Library
South Brooklyn Branch
4303 Pearl Road
Cleveland, OH 44109
(216) 623-7067

Brook Park Branch Library
6155 Engle Road
Brook Park, OH 44142
(440) 267-5250

Olmsted Falls Branch Library
7850 Main Street
Olmsted Falls, OH 44138
(440) 235-1150

Geauga County Park District
9160 Robinson Road
Chardon, OH 44024
(440) 286-9504

Lorain County Metroparks
12882 Diagonal Road
LaGrange, OH 44050
(440) 458-5121

Chagrin River Land Conservancy
12768 Chillicothe Rd., 2nd Floor
Chesterland, OH 44026
(440) 729-9621

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199
(716) 879-4330
(By Appointment Only)

U.S. Army Corps of Engineers
33 Grand Valley Ave
Orwell, OH 44076
(440) 437-5840
(By Appointment Only)

U.S. Army Corps of Engineers
1616 East Wooster Street
Bowling Green, OH 43402
(419) 353-6307
(By Appointment Only)

Questions pertaining to the work described in this notice should be directed to Alan R. Anachecka-Nasemann, who can be contacted by calling (716) 879-4319, or by e-mail at:
alan.r.anachecka-nasemann@usace.army.mil

The following authorization(s) may be required for this project:

Water Quality Certification (or waiver thereof) from the Ohio Environmental Protection Agency.

There is one registered historic property or a property listed as being eligible for inclusion in the National Register of Historic Places that will be affected by this project. Expansion of Cleveland Hopkins International Airport will necessitate the demolition of the NASA Rocket Engine Test Facility. This impact will be addressed by the Federal Aviation Administration. A second historic property may also be affected by this project. The Doan Brook Stream Restoration Project will be constructed in the vicinity of the Rockefeller Park Bridges, which are listed in the National Register of Historic Places. In addition, the Magnolia-Wade Park Historic District, the Doan School, and the Wade Park District and several additional sites listed on the National Register are located within 0.5 mile of the Doan Brook corridor.

In addition, available evidence indicates that the proposed work will not affect a species proposed or designated by the U.S. Department of the Interior as threatened or endangered, nor will it affect the critical habitat of any such species.

This notice is promulgated in accordance with Title 33, Code of Federal Regulations, parts 320-330. Any interested party desiring to comment on the work described herein may do so by submitting their comments, in writing, so that they are received no later than 4:30 pm on the expiration date of this notice.

Comments should be sent to the U. S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199, and should be marked to the attention of Alan R. Anachecka-Nasemann, or by e-mail at: alan.r.anachecka-nasemann@usace.army.mil. A lack of response will be interpreted as meaning that there is no objection to the work as proposed.

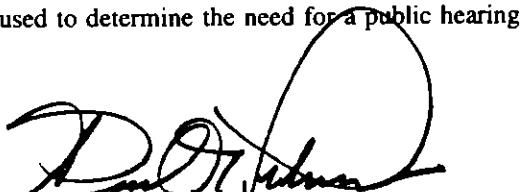
Comments submitted in response to this notice will be fully considered during the public interest review for this permit application. All written comments will be made a part of the administrative record. Due to resource limitations, this office will normally not acknowledge the receipt of comments or respond to individual letters of comment.

Any individual may request a public hearing by submitting their written request, stating the specific reasons for holding a hearing, in the same manner and time period as other comments.

Public hearings for the purposes of the Corps permit program will be held when the District Commander determines he can obtain additional information, not available in written comments, that will aid him in the decision making process for this application. A Corps hearing is not a source of information for the general public, nor a forum for the resolution of issues or conflicting points of view (witnesses are not sworn and cross examination is prohibited). Hearings will not be held to obtain information on issues unrelated to the work requiring a permit, such as property ownership, neighbor disputes, or the behavior or actions of the public or applicant on upland property not regulated by the Department of the Army. Information obtained from a public hearing is given no greater weight than that obtained from written comments. Therefore, you should not fail to make timely written comments because a hearing might be held.

The decision to approve or deny this permit request will be based on an evaluation of the probable impact, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among these are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, state and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

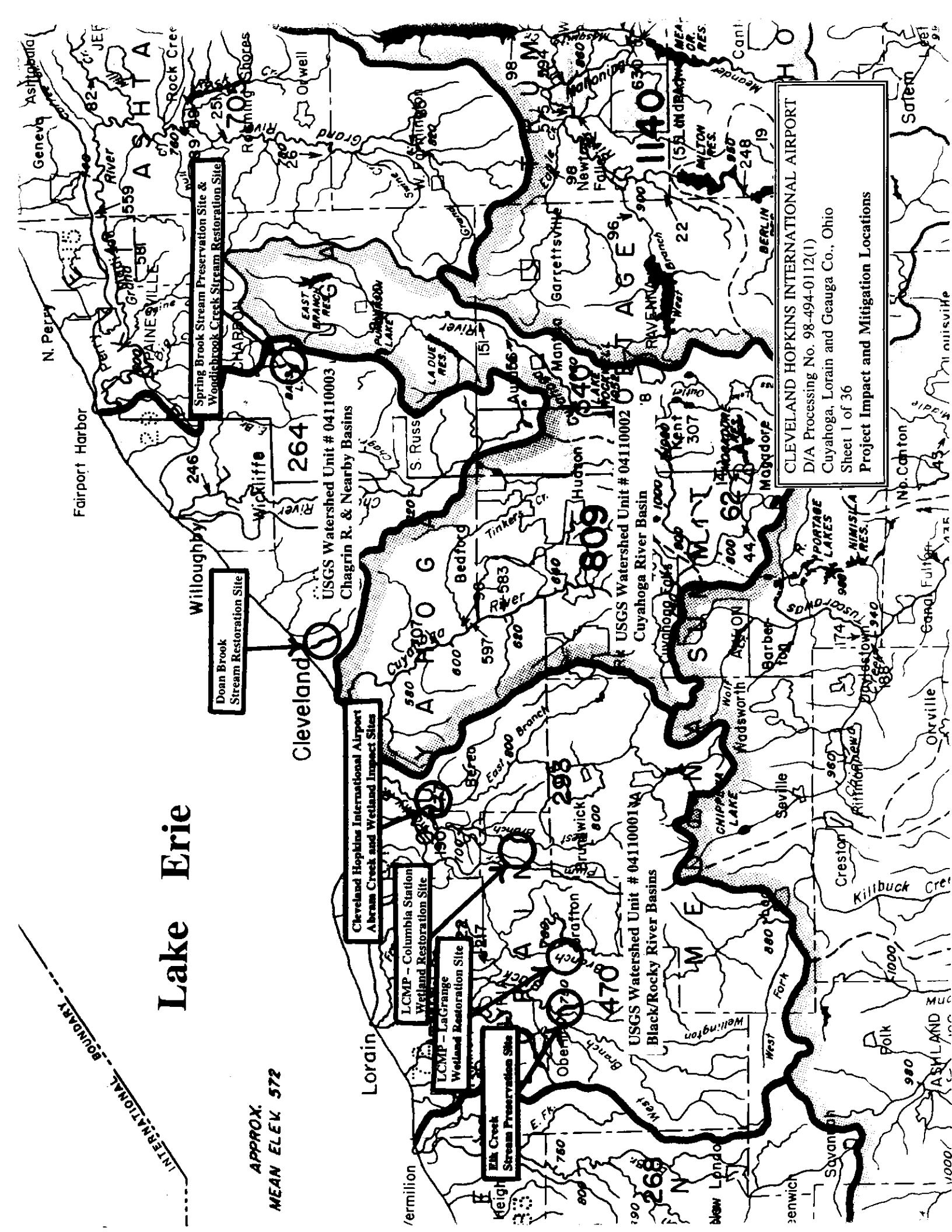


Paul G. Leuchner
Chief, Regulatory Branch

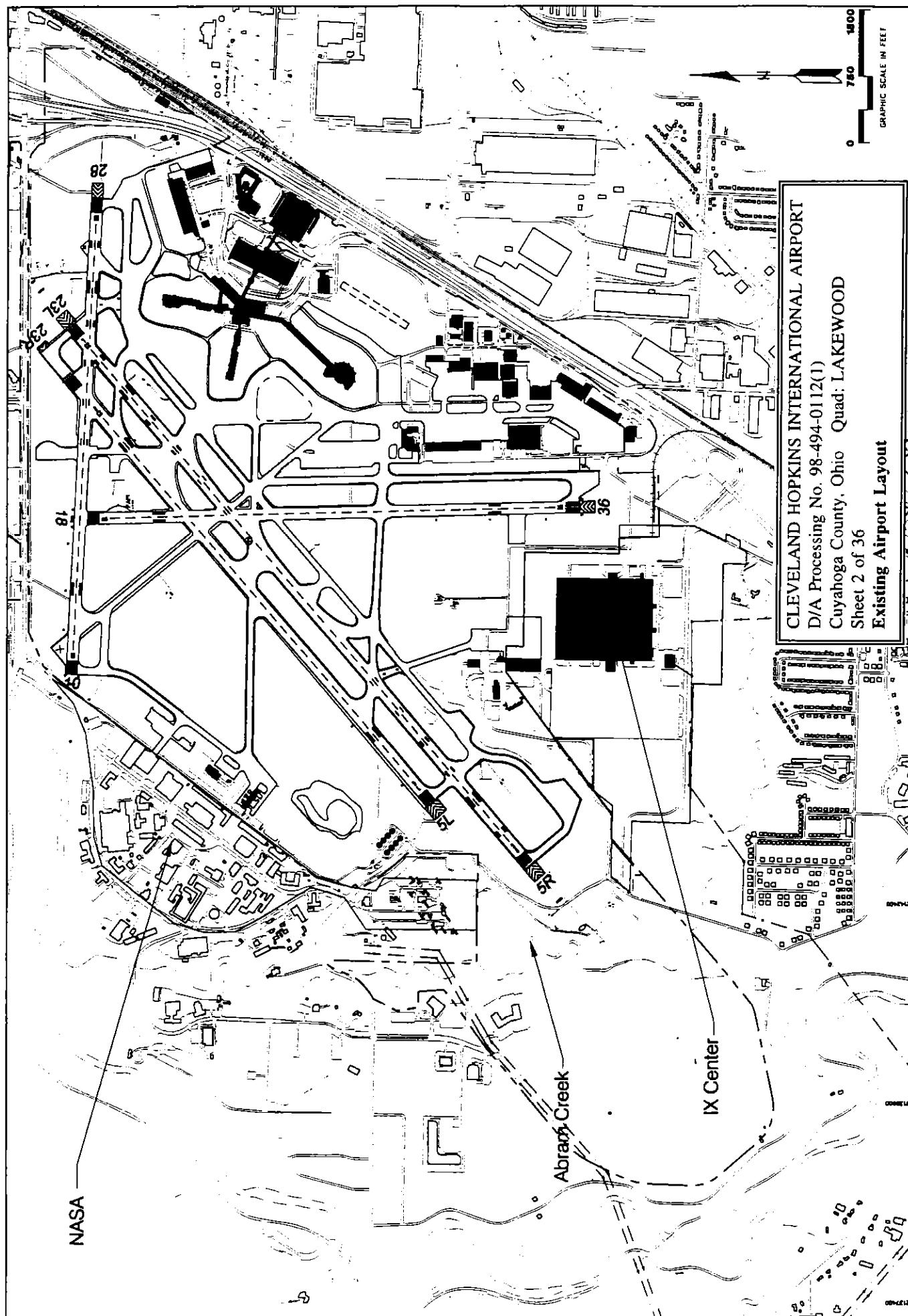
NOTICE TO POSTMASTER: It is requested that this notice be posted continuously and conspicuously for 30 days from the date of issuance.

Lake Erie

MEAN ELEV 572 APPROX.



NASA



Cleveland Hopkins International Airport
Environmental Impact Statement

Existing Airport Layout

Exhibit
1-2

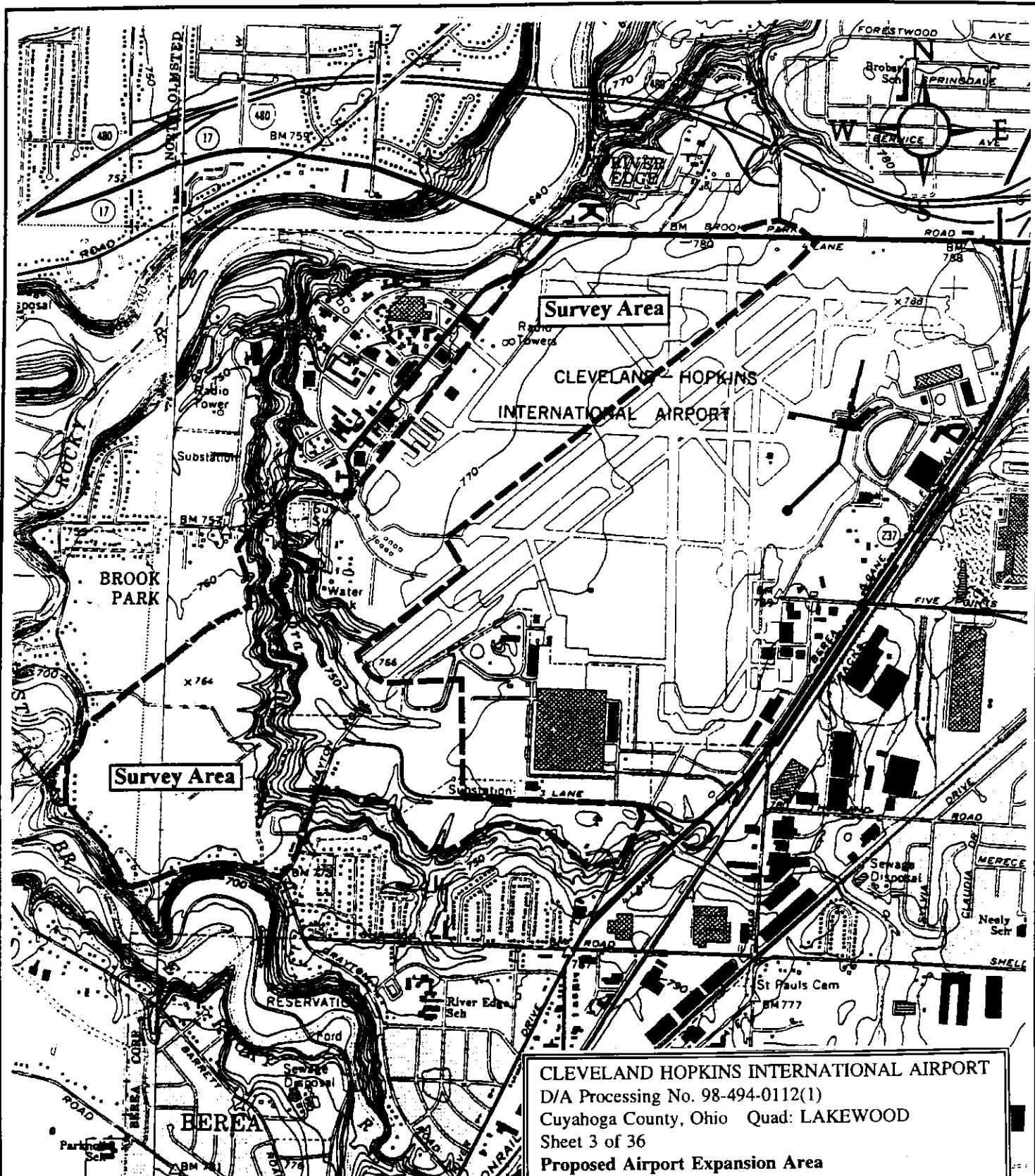
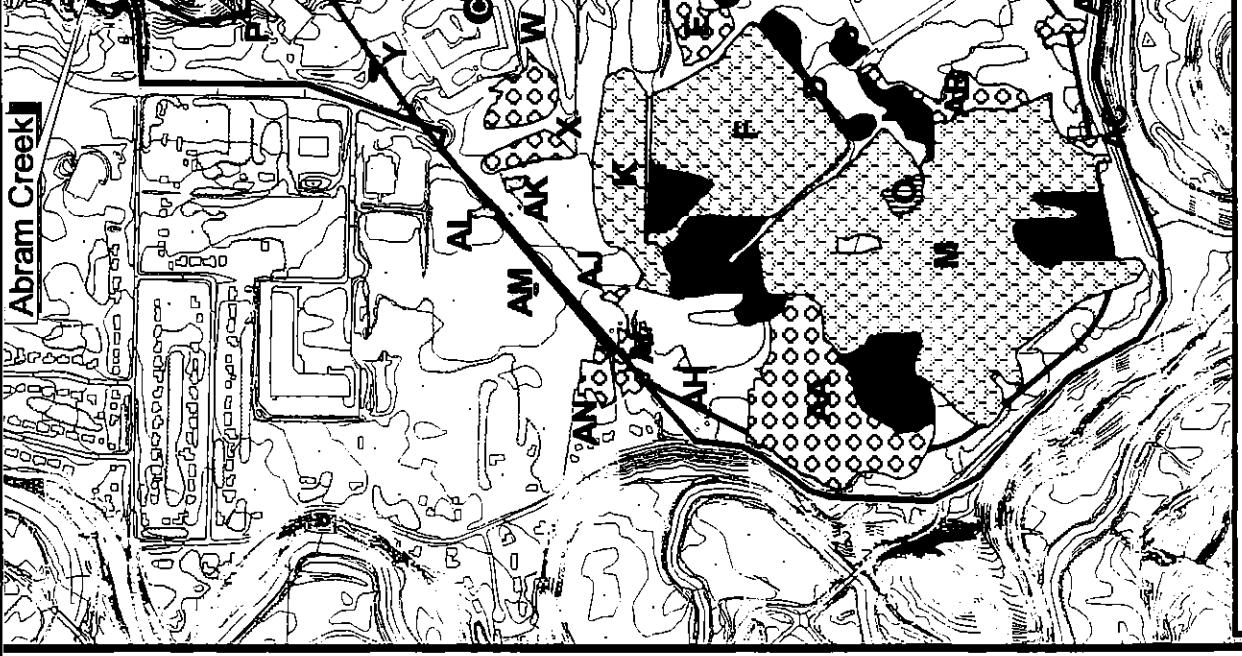


Figure 2

Cleveland Hopkins International Airport
and the Proposed Expansion Area

Lakewood and North Olmsted, Ohio
USGS Topographic Quadrangles
Scale: 1:24,000
Environment and Archaeology, LLC

CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-01(21)
Cuyahoga County, Ohio Quad: LAKEWOOD
Sheet 4 of 36
Existing Wetlands and Streams



Cleveland Hopkins International Airport

Wetland and Stream Features

Exhibit: 4-1

CHAPTER FOUR – CHARACTERISTICS OF CURRENT CONDITIONS

Table 4-2 Wetlands in the Cleveland Hopkins International Airport Study Area.
Cleveland Hopkins International Airport

ID #	CLASS	DESCRIPTION AND DOMINANT SPECIES	OEPA CAT.	Total Acres	Acreage within CLE Property	Affected Acreage
A	PSS1Y	Depressional, shrub wetland overlooking Abram Creek with pin oak, ironwood, dogwood, sycamore, soft-rush, deer-tongue and peppermint.	1	0.08	0.08	0.08
B ¹	PEM1Y	Depressional, emergent wetland southeastr of light lane and access road with wool-grass, path rush, soft rush, deer-tongue, swamp milkweed, false pimpernel and peppermint.	3	0.52	0.52	0.52
C	PEM1Y	Drainage wetland from access road to Abram Creek dominated by reed grass with horsetail, black willow, green ash and cottonwood.	1	0.37	0.37	0.37
D ¹	PEM1Y	Diked, emergent wetland isolated by ditch and access road with wool-grass, path rush, soft rush, American elm, sensitive fern, swamp milkweed, dogwood and Japanese honeysuckle.	3	1.56	1.56	1.56
E ¹	PSS1Y	Depressional, scrub-shrub wetland isolated by ditches and access road with meadowsweet, dogwood, arrowwood, pin oak, wool-grass, grass-leaf goldenrod, swamp milkweed, and soft rush.	3	2.07	2.07	2.07
F ¹	PFO1Y	Flooded forest wetland with silver maple, pin oak, green ash, dogwood, American elm.	3	14.99	14.99	14.99
G	PEM1Y	Depressional, emergent wetland in Abram Creek flood plain 500' west of Grayton Road with American elm, ironwood, dogwood, blue flag, moneywort, arrowhead, touch-me-not and kwl manna grass.	1-2	0.06	0	0
H	man-made	Drainage, hillside, emergent wetland from Grayton Road to Abram Creek dominated by reed grass.	N/A	0	0	0
I ¹	PEM1Y	Depressional, emergent wetland at end of Wood Block Road with wool-grass, sedges, sensitive fern, groovebur, swamp milkweed, blue vervain, soft rush, and arrowwood.	3	4.86	4.86	4.86
J ¹	PEM1Y	Depressional, emergent wetland between Old Five Points Road and Wetland F with wool-grass, fringed sedge, sensitive fern, soft rush and arrowhead.	3	1.68	1.68	1.68
K	PFO1Y	Forested wetland with silver maple, pin oak, green ash, dogwood, American elm.	3	5.96	5.96	5.96
L ¹	PEM1Y	Abandoned agricultural field with Canada goldenrod, soft rush, grassleaf goldenrod	3	3.02	3.02	2.71

¹ part of the large contiguous wetland communities.

Table 4-2 Wetlands in the Cleveland Hopkins International Airport Study Area cont.
Cleveland Hopkins International Airport

ID #	CLASS	DESCRIPTION AND DOMINANT SPECIES	OEPA CAT.	Total Acres	Acreage within CLE Property	Affected Acreage
M ¹	PFO1Y	Central forested wetland with silver maple, pin oak, green ash, dogwood, American elm.	3	38.02	37.38	33.69
N ¹	PEM1Y	Emergent wetland south of light lane with wool-grass, path rush, soft rush, prairie dogbane, deer-tongue, swamp milkweed, cattail, sensitive fern and horsetail (Noted as a pond on USDA Soil Map).	3	1.43	1.43	1.43
O ¹	POW	Submerged wetland west of light lane with wool-grass, soft rush, swamp knurweed, water hor-hound, swamp milkweed, cattail, sensitive fern and sedges (Noted as a pond on City GIS map).	3	0.62	0.62	0.62
P ¹	PEM1Y	Depression, emergent wetland between Pond Q and Abram Creek gorge with blue flag, shallow sedge, sensitive fern, dogwood and arrowhead.	2	0.15	0.15	0
Pond Q ²	POW	Small pond in Abram Creek flood plain at old home site with sunfish, bass and submerged plants.	NA	0.19	0.19	0
R ¹	PFO1Y	Depression, wooded wetland along proposed Aerospace Parkway with silver maple, green ash, box-elder, hawthorn dogwood, American elm, soft-rush, sedges and cattail.	2	0.29	0	0
S ¹	PFO1Y	Wooded wetland along proposed Aerospace Parkway with silver maple, green ash, box-elder, hawthorn, American elm, soft-rush, avens, sedges and cattail.	2	0.89	0	0
T ¹	PFO1Y	Depression, wooded wetland along proposed Aerospace Parkway with silver maple, sycamore, dogwood, black willow, American elm, water plantain, soft-rush, sedges and cattail.	2	1.64	0	0
U ²	PFO1Y	Depression, wooded wetland along proposed Aerospace Parkway with silver maple, cottonwood, dogwood, black willow, American elm, soft-rush, sedges and cattail.	2	0.08	0	0
V ²	PSS1Y	Depression, shrub wetland north of I-X Center Road and west of I-X Center with dogwood, hickory, wool-grass, swamp milkweed, prairie dogbane and soft rush.	2	0.85	0	0
W	PSS1Y	Depression, shrub wetland SE of Aerospace Drive with dogwood, green ash, meadowsweet, purple loosestrife, cattail, reed, wool-grass, green bulrush, swamp milkweed and soft rush.	2	2.05	2.05	1.93

¹ part of the large contiguous wetland communities.

² off-site wetland that will not be directly impacted by proposed airport expansion.

CHAPTER FOUR – CHARACTERISTICS OF CURRENT CONDITIONS

Table 4-2 Wetlands in the Cleveland Hopkins International Airport Study Area cont.
Cleveland Hopkins International Airport

ID #	CLASS	DESCRIPTION AND DOMINANT SPECIES	OERIA CAT.	Total Acres	Acreage within CLP Property	Affected Acreage
X	PSS1Y	Depression, shrub wetland SE of Aerospace Drive with green ash, pin oak, arrowwood, box elder, swamp milkweed, prairie dogbane, grooveburr, yellow avens and soft rush	2	1.24	1.24	0.71
Y	PEM1Y	Drainage, emergent wetland with common reed and cattail.	1	0.09	0	0
Z ²	PEM1Y	Depression, emergent wetland along proposed Aerospace Parkway and contiguous with Wetland U with sedges, soft rush, meadow foxtail and fowl manna grass.	2	0.08	0	0
AA ¹	PSS1Y	Edge wetland with silver maple, pin oak, dogwood, American elm, grass-leaf goldenrod.	3	11.17	8.57	8.52
AB ¹	PSS1Y	Edge shrub wetland with silver maple, pin oak, green ash, dogwood, American elm, grass-leaf goldenrod, glossy buckthorn.	3	2.10	2.10	1.89
AC ¹	PSS1Y	Edge shrub wetland with silver maple, pin oak, dogwood, American elm, grass-leaf goldenrod, and swamp rose.	3	0.33	0.16	0
AD ¹	PEM1Y	Abandoned agriculture field with Canada goldenrod, soft rush, grass-leaf goldenrod.	3	3.94	3.94	3.94
AE	PEM1Y	Blocked drain near side of Grayton Road with dogwood, cattail, red grass, water-pepper and pin oak.	2	0.11	0.11	0.11
AF	PEM1Y	Slope seepage, north side of Abram Creek with red grass, honseter and sensitive fern	2 ³	0.01	0.01	0
AG	PSS1Y	Isolated depression north of Ruple Parkway with wood reed grass, thistle, fowl meadow grass and juncseed.	2 ³	0.47	0.32	0.1
AH	PEM1Y	Depression, emergent wetland northeast of Ruple Parkway with soft rush, bulrush, red canary grass and dogwood.	1 ³	0.04	0.04	0.01
AI	PSS1Y	Depression, shrub wetland in electric power ROW with soft rush, elm, cottonwood, arrow-wood and fowl manna grass.	2	1.02	0.62	0
AJ	PSS1Y	Depression, shrub wetland in electric power ROW with sedges, soft rush, bulrush, elm, dogwood, pin oak and reed grass.	2 ³	0.14	0.14	0
AK	PFO1Y	Edge forest wetland with red maple, slippery elm, wood reed grass.	2 ³	0.15	0.15	0

CLEVELAND HOPKINS INTERNATIONAL AIRPORT
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Cuyahoga County, Ohio
Sheet 7 of 36
Wetland Characteristics (cont.)

CHAPTER FOUR – CHARACTERISTICS OF CURRENT CONDITIONS

Table 4-2 Wetlands in the Cleveland Hopkins International Airport Study Area cont.
Cleveland Hopkins International Airport

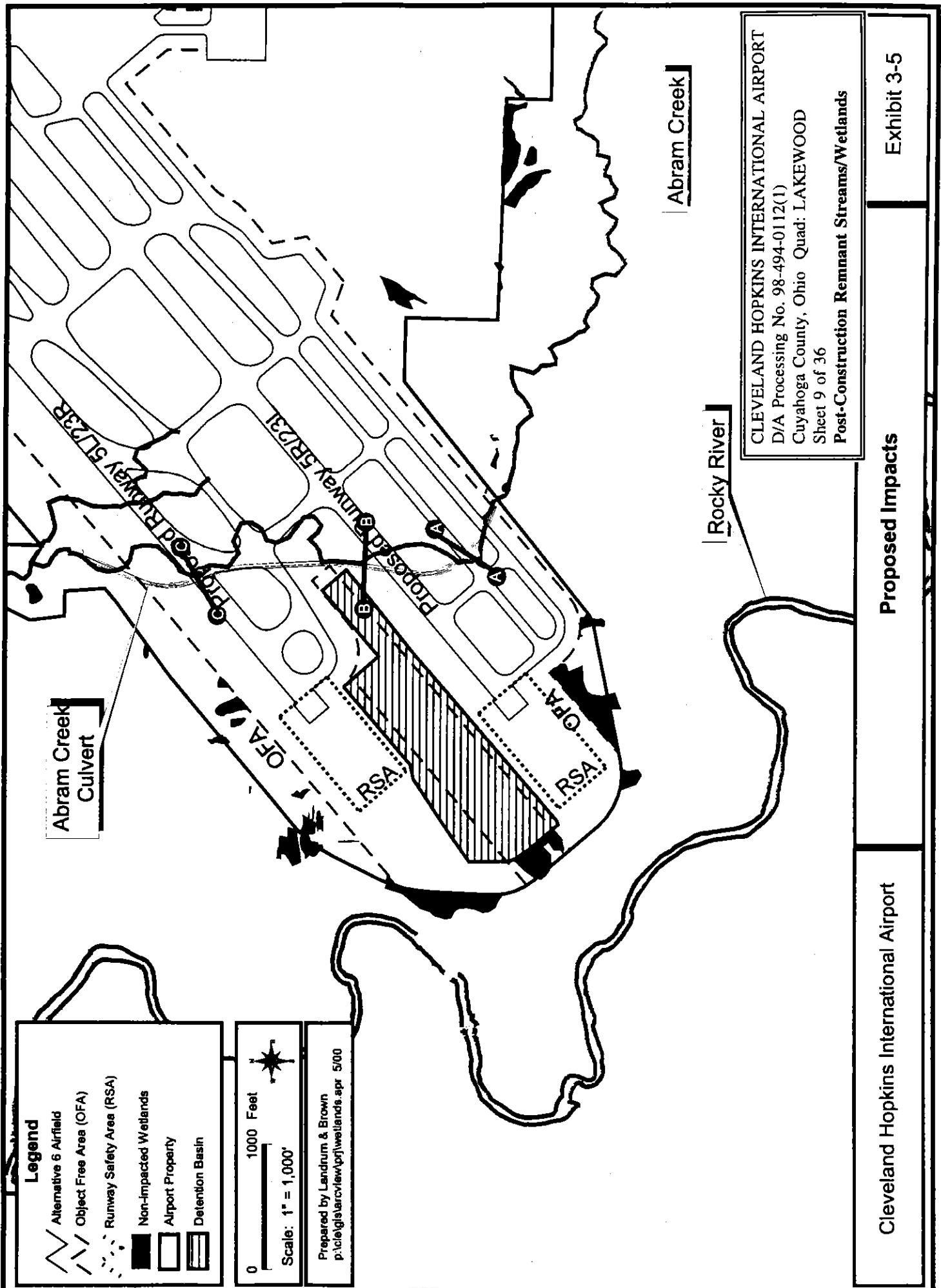
ID #	CLASS	DESCRIPTION AND DOMINANT SPECIES	OPEPA CAT.	Total Acre	Acreage within CLE Property	Affected Acreage
AL	PFOIY	Edge forest wetland with red maple and slippery elm.	2 ³	0.19	0.07	0
AM	PFOIY	Forest wetland with sugar maple, red maple, pin oak, and swamp white oak	NA ³	0.02	0.00	0
AN	PSSIY	Shrub wetland with slippery elm, stiff dogwood, glossy buckthorn, multiflora rose, northern arrow wood.	NA ³	0.88	0.00	0
AO	PSSIY	Shrub wetland with wood reedgrass, small water plantain, soft rush, common reed, water purslane, and wool grass.	NA ³	0.13	0.00	0
AP	PFOIY	Forest wetland with wood reedgrass, slippery elm, and moneywort.	NA ³	0.04	0.00	0
AQ	PSSIY	Shrub wetland with soft rush, silky dogwood, stiff dogwood, path rush, blunt mountain mint, and multiflora rose	NA ³	0.06	0.00	0
AR	PSSIY	Shrub wetland with soft rush, silky dogwood, stiff dogwood, path rush and curled jock	NA ³	0.09	0.00	0
TOTAL WETLANDS and OPEN WATERS						
SUBTOTAL PALUSTRINE FOREST WETLANDS						
SUBTOTAL PALUSTRINE SCRUB-SHRUB WETLANDS						
SUBTOTAL PALUSTRINE EMERGENT WETLANDS						
SUBTOTAL OPEN WATER and VERNAL POOL						
WETLANDS NOT DIRECTLY IMPACTED BY PROJECT						

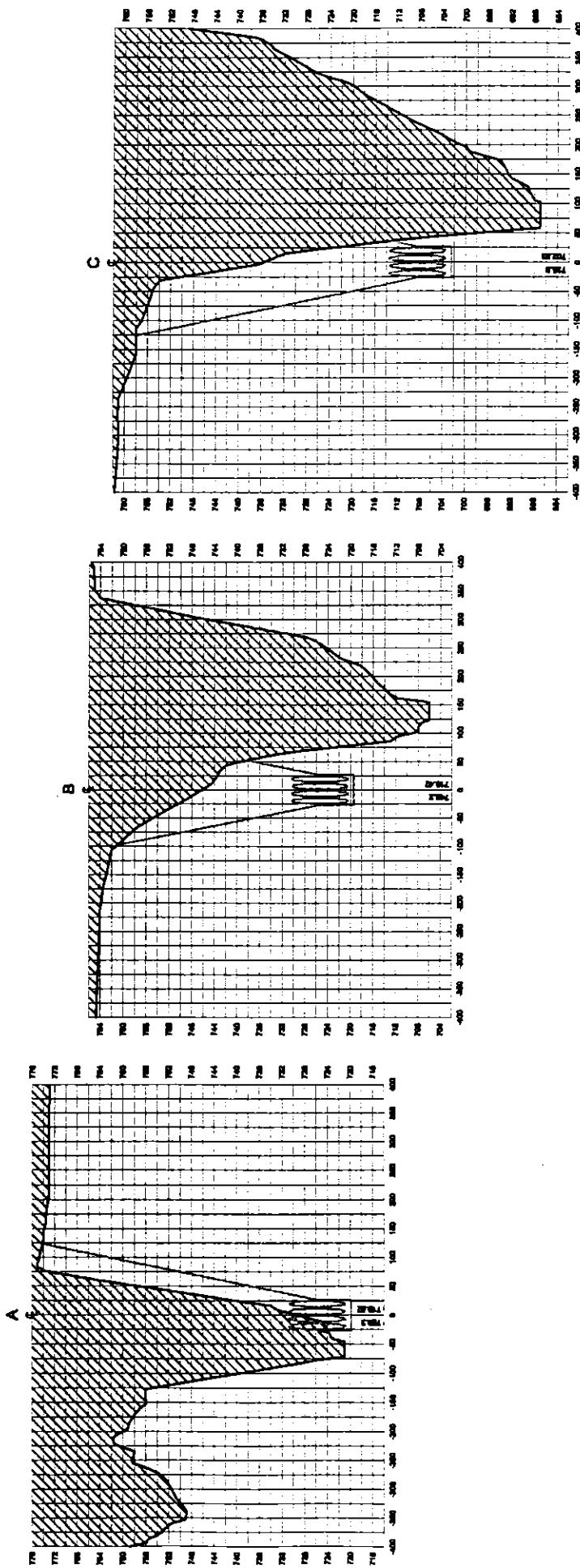
¹ part of the large contiguous wetland communities.

² off-site wetland that will not be directly impacted by proposed airport expansion.

³ Ohio Wetland Assessments data was not available at the time of this report.

CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Cuyahoga County, Ohio
Sheet 8 of 36
Wetland Characteristics (cont.)



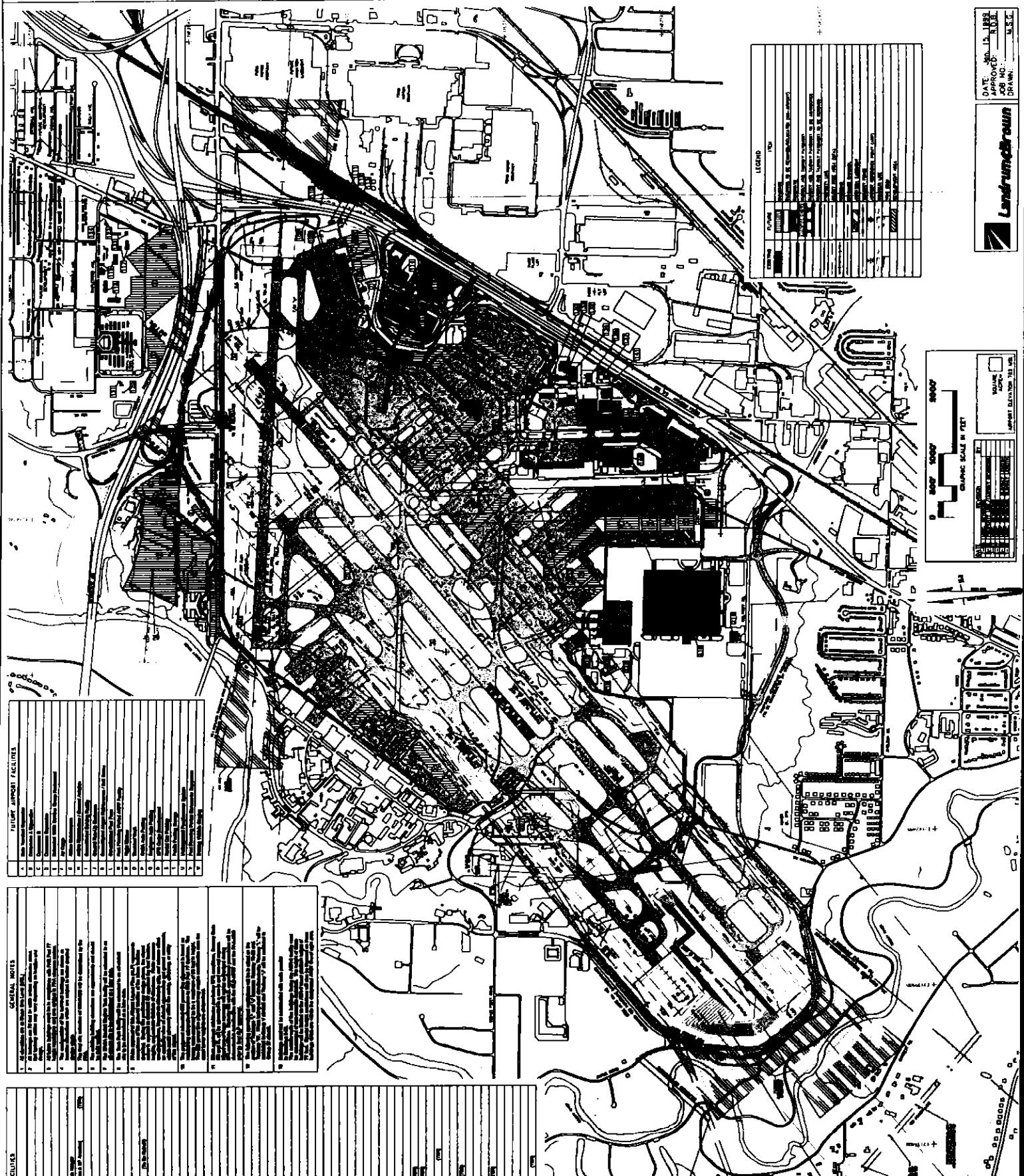


CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Cuyahoga County, Ohio Quad: LAKEWOOD
Sheet 10 of 36
Abram Creek Corridor Cross Sections

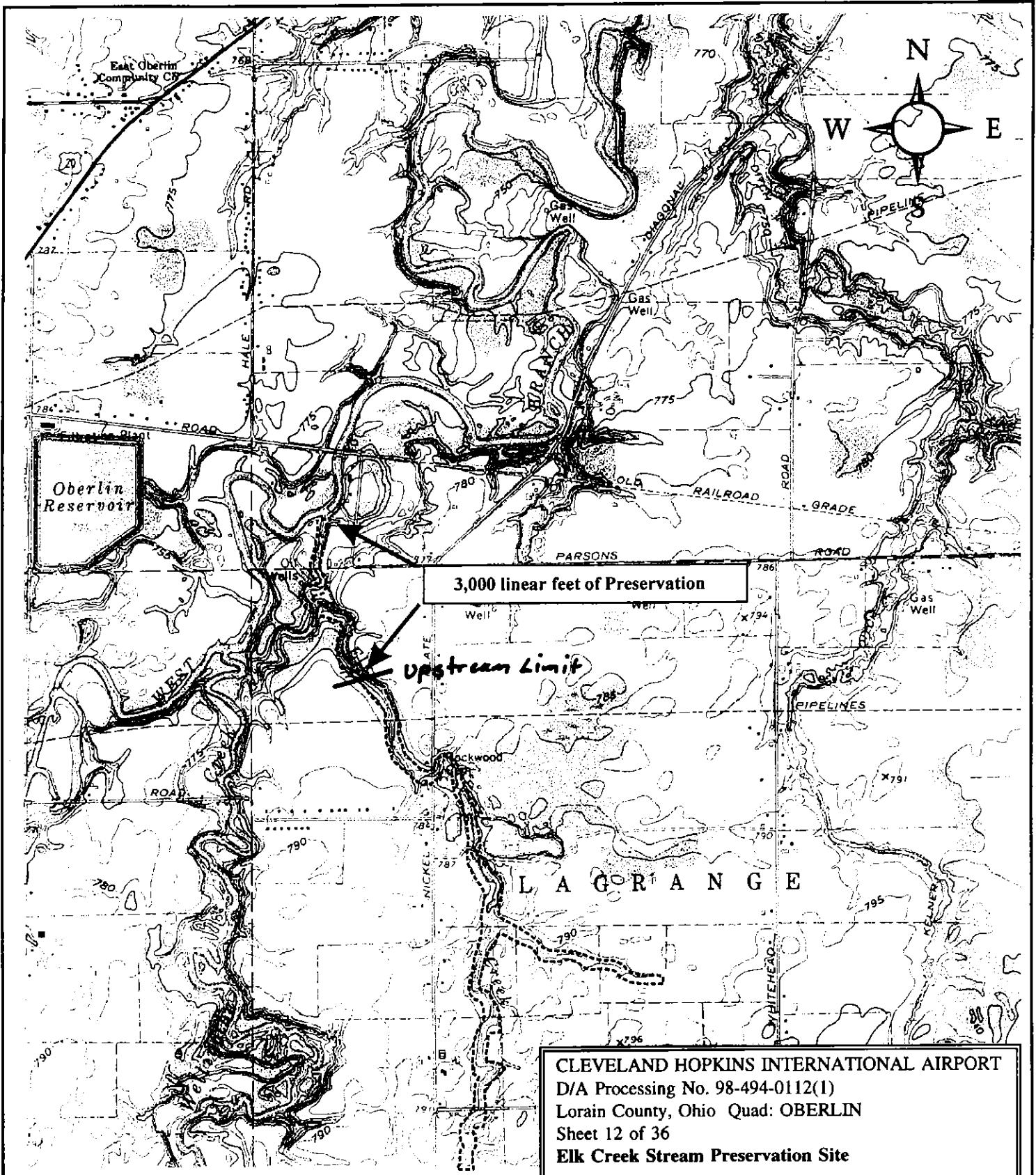
Abram Creek Cross Sections

Exhibit:
3-6

Cleveland Hopkins International Airport

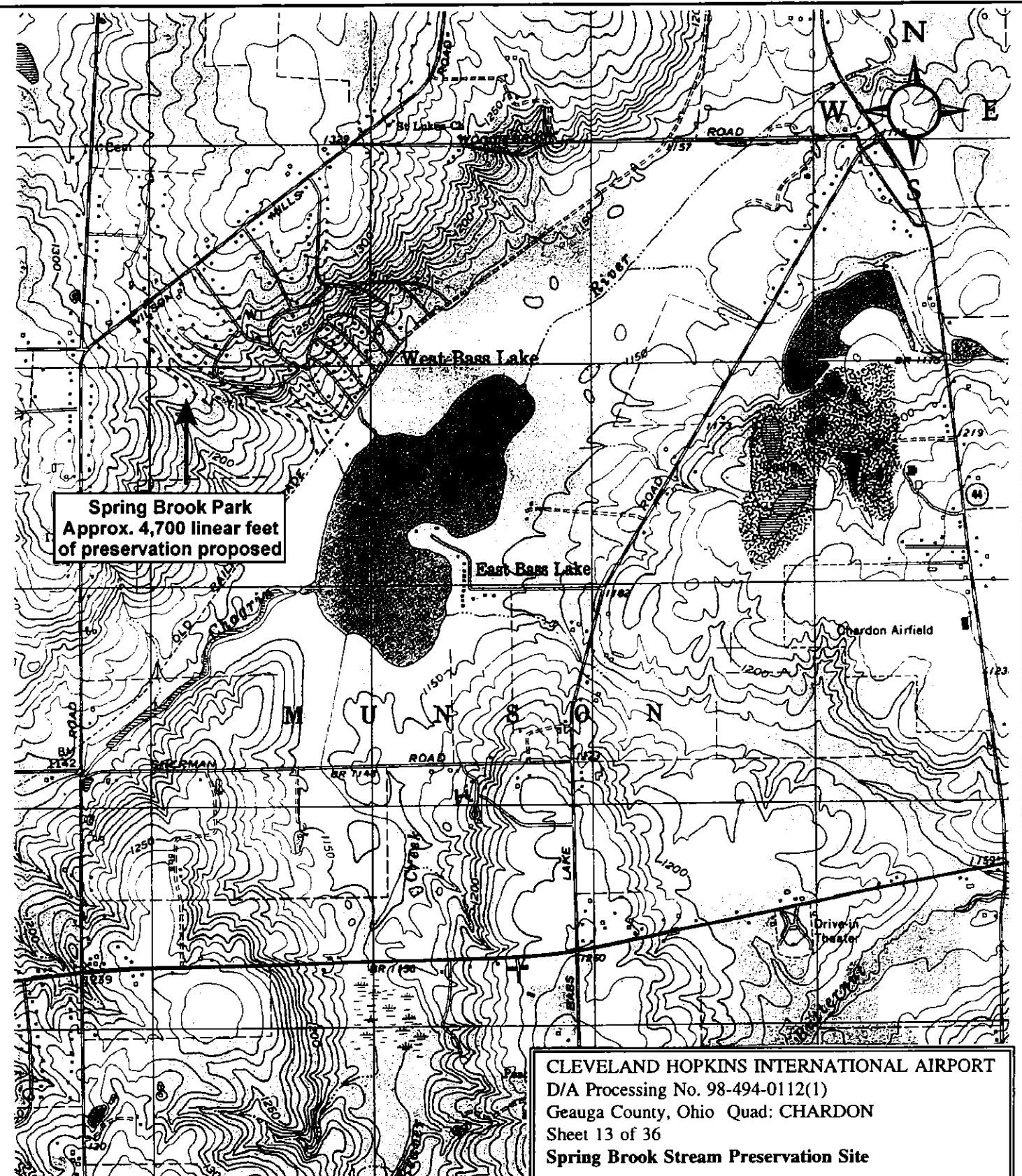


CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Cuyahoga County, Ohio Quad: LAKEWOOD
Sheet 11 of 36
Proposed Final Airport Layout



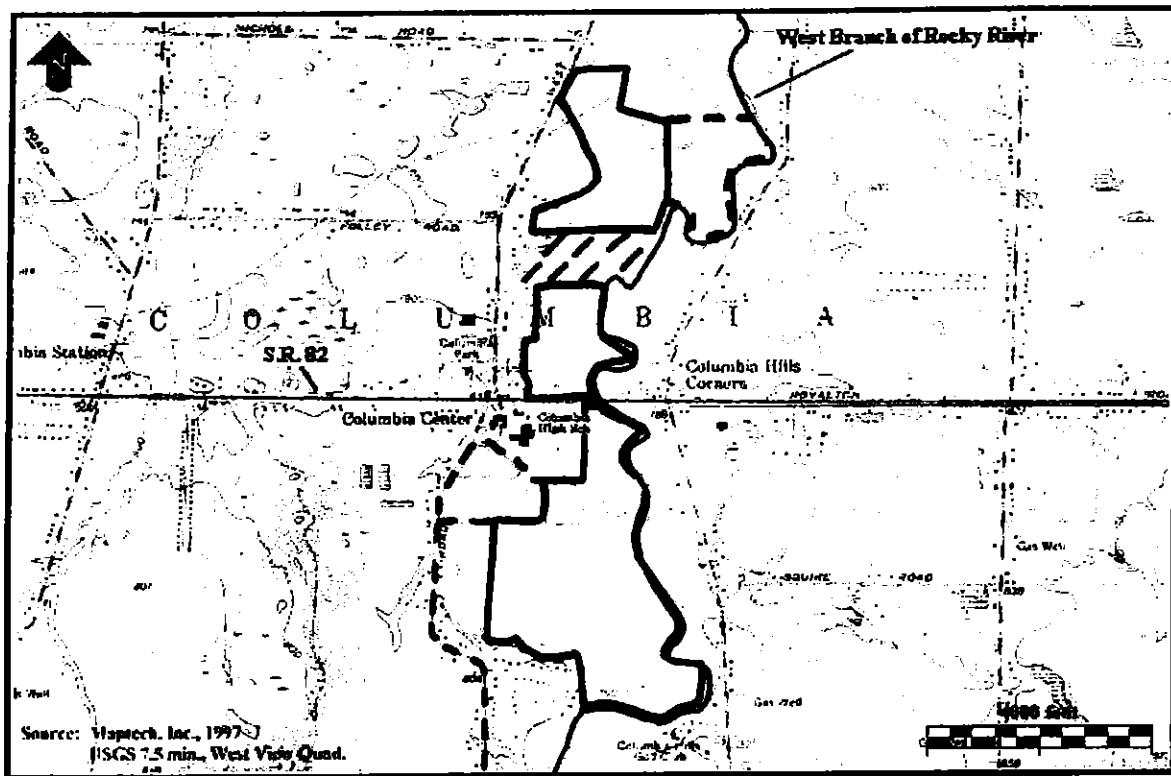
**Cleveland Hopkins International Airport
Proposed Stream Mitigation Site
Elk Creek**

**USGS 7.5' Topographic Map
Oberlin, Ohio Quadrangle
LaGrange Township, Lorain County
Photorevised 1979
Scale: 1:24,000**



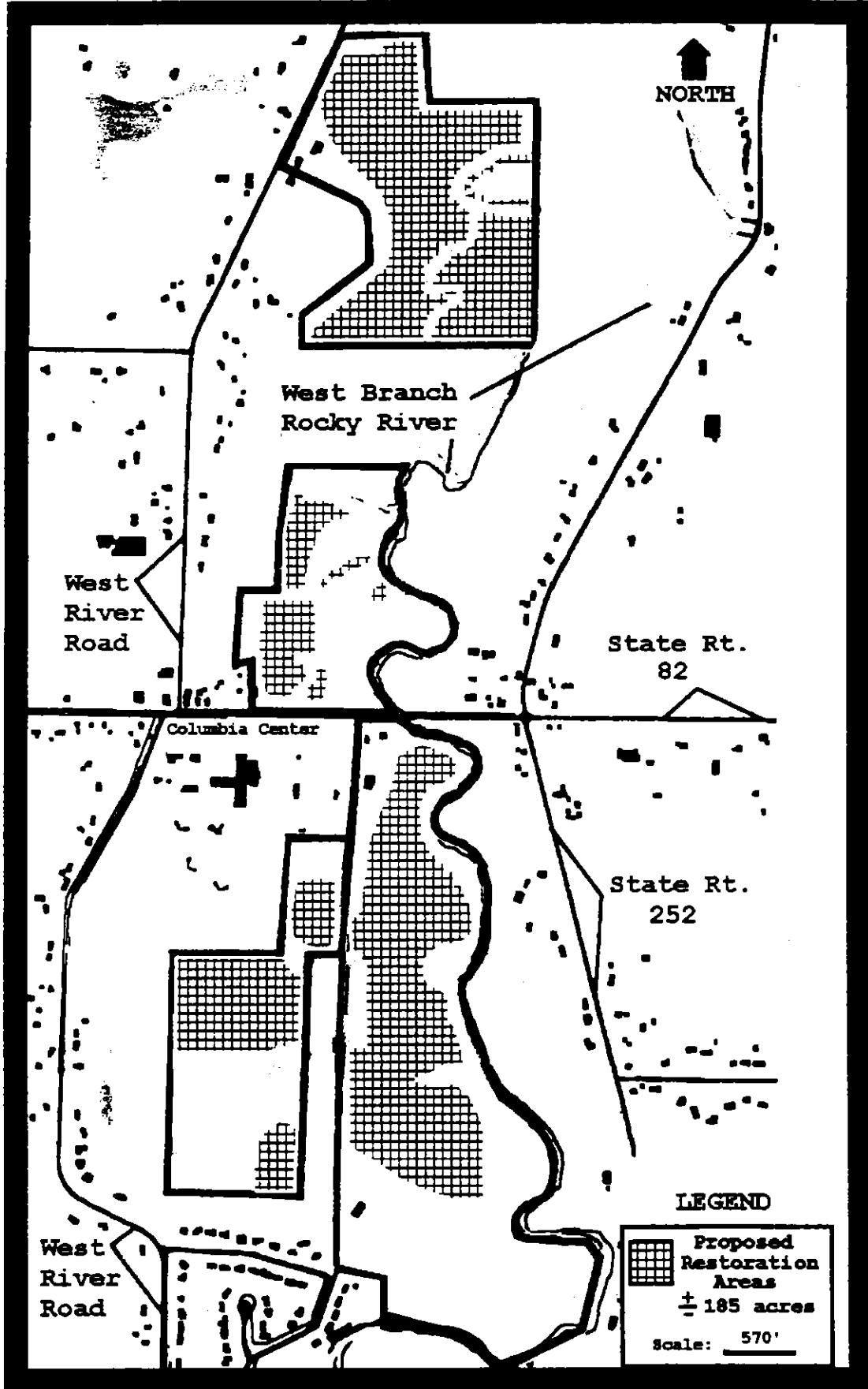
**Cleveland Hopkins International Airport
Proposed Stream Preservation Site
Spring Brook Park**

**USGS 7.5' Topographic Map
Chardon, Ohio Quadrangle
Munson Township, Geauga County
1994
Scale: 1:24,000**



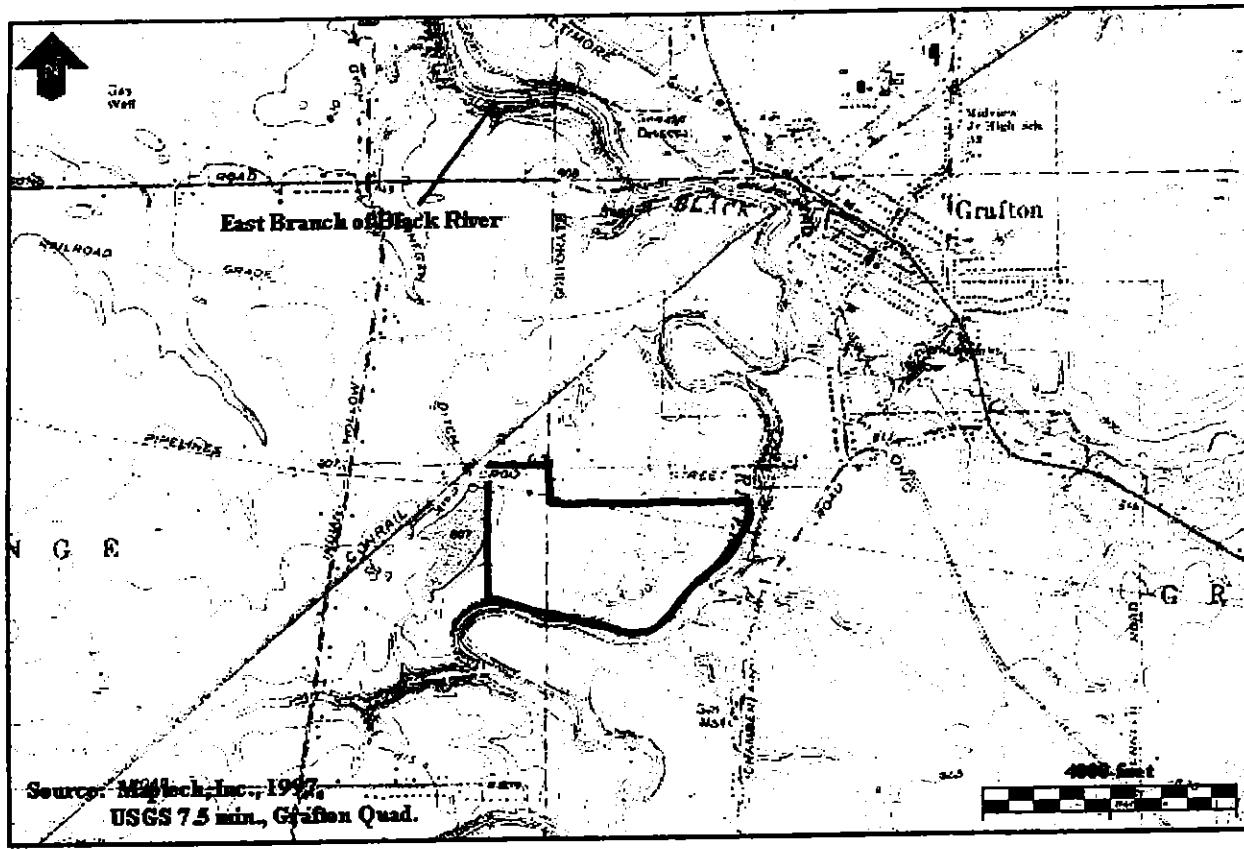
CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Lorain County, Ohio Quad: WEST VIEW
Sheet 14 of 36
LCMP Columbia Wetland Restoration Sites

Figure 2: USGS topographic map of Columbia Township mitigation sites



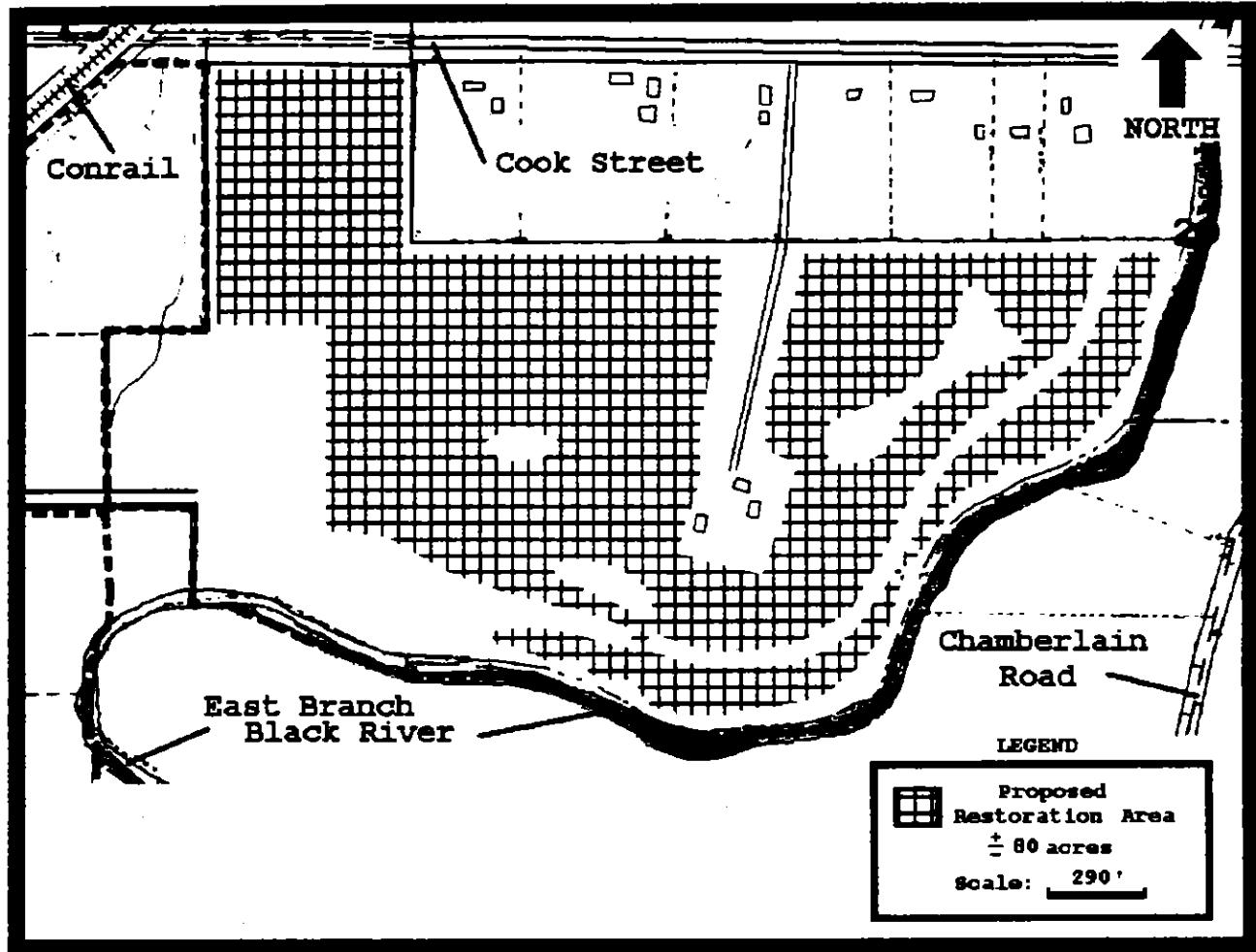
CLEVELAND HOPKINS INTERNATIONAL AIRPORT
 D/A Processing No. 98-494-0112(1)
 Lorain County, Ohio Quad: WEST VIEW
 Sheet 15 of 36
Columbia Wetland Restoration - Details

Figure 6, Sheet 8: Approximate Restoration / Enhancement Acres at Columbia Township



CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Lorain County, Ohio Quad: GRAFTON
Sheet 16 of 36
LCMP LaGrange Wetland Restoration Site

Figure 2a: USGS topographic map of LaGrange Township mitigation site

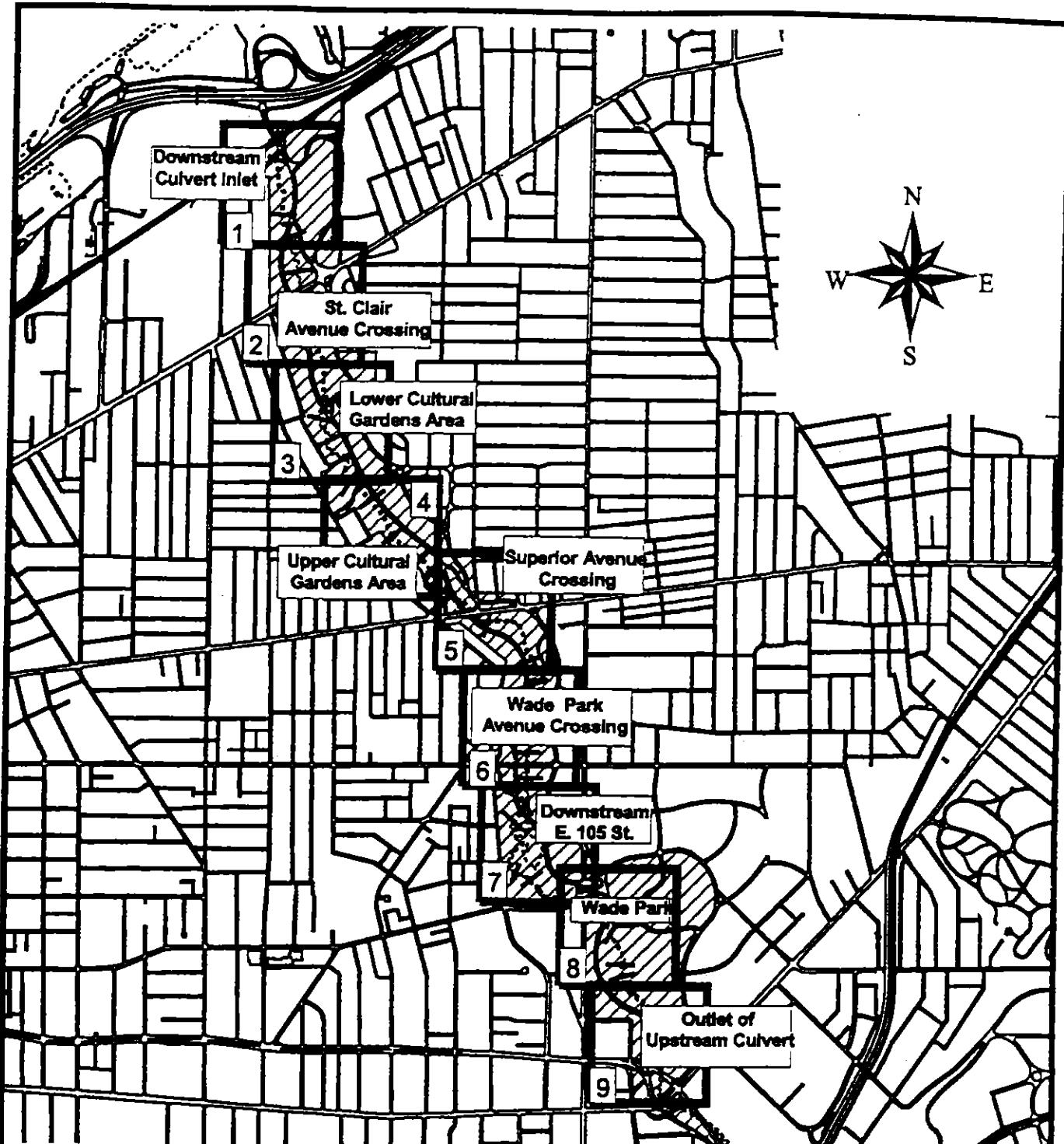


CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Lorain County, Ohio Quad: Grafton
Sheet 17 of 36
LaGrange Wetland Restoration - Details

Figure 6, Sheet 9: Approximate Restoration acres at LaGrange Township



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Cuyahoga County, Ohio
Quads: CLEVELAND NORTH/EAST CLEVELAND
Sheet 18 of 36
Doan Brook Stream Restoration Site



CLEVELAND HOPKINS INTERNATIONAL AIRPORT
D/A Processing No. 98-494-0112(1)
Cuyahoga County, Ohio
Quads: CLEVELAND NORTH/EAST CLEVELAND
Sheet 19 of 36
Doan Brook Stream Restoration - Index Map

Legend

- | | |
|--|-------------------------------|
| | Stream Sections |
| | Existing Channel |
| | Example Cross Sections |
| | Road and Rail |
| | Park Boundaries |

Figure 3: Index Map For Stream Segments

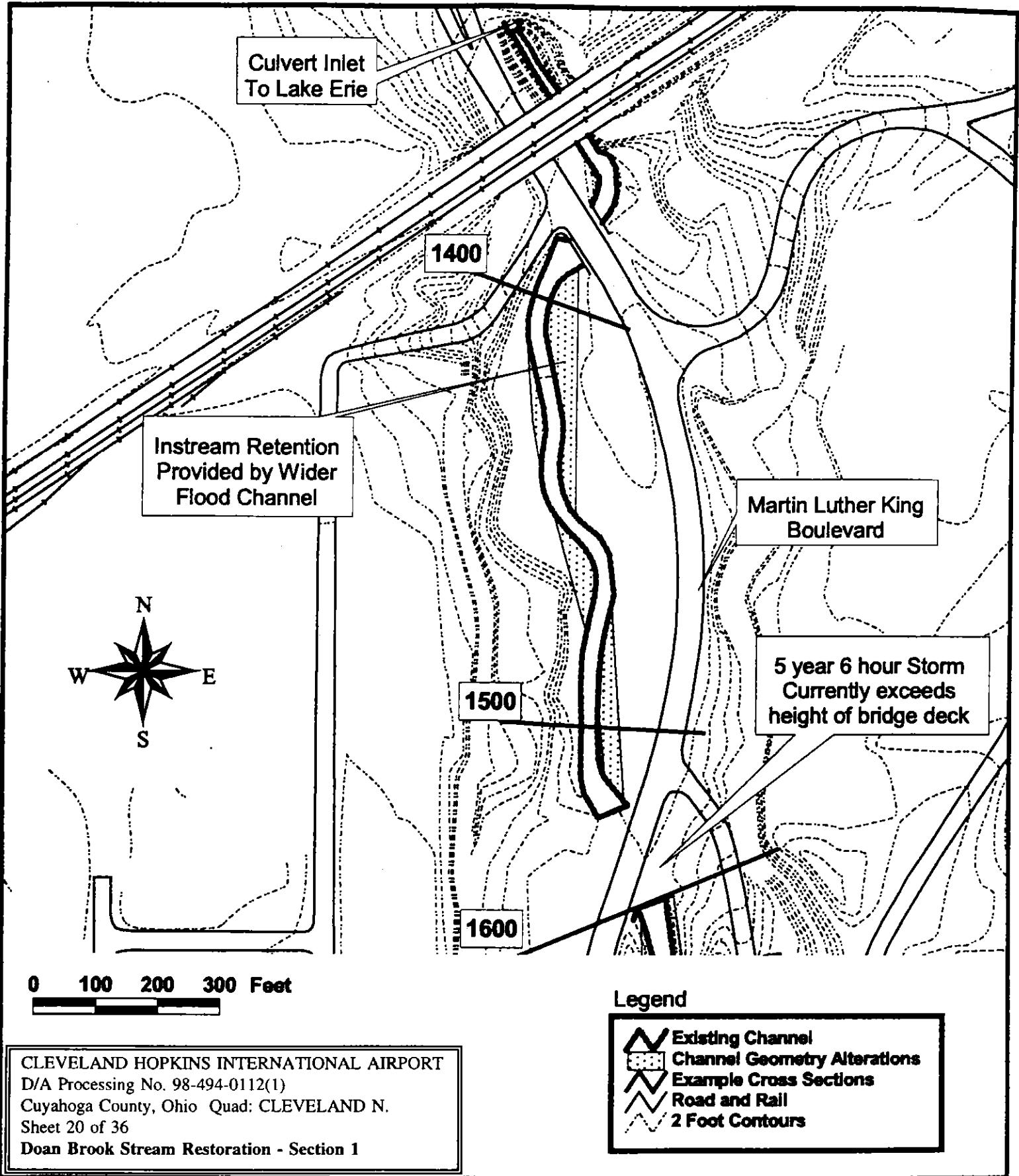
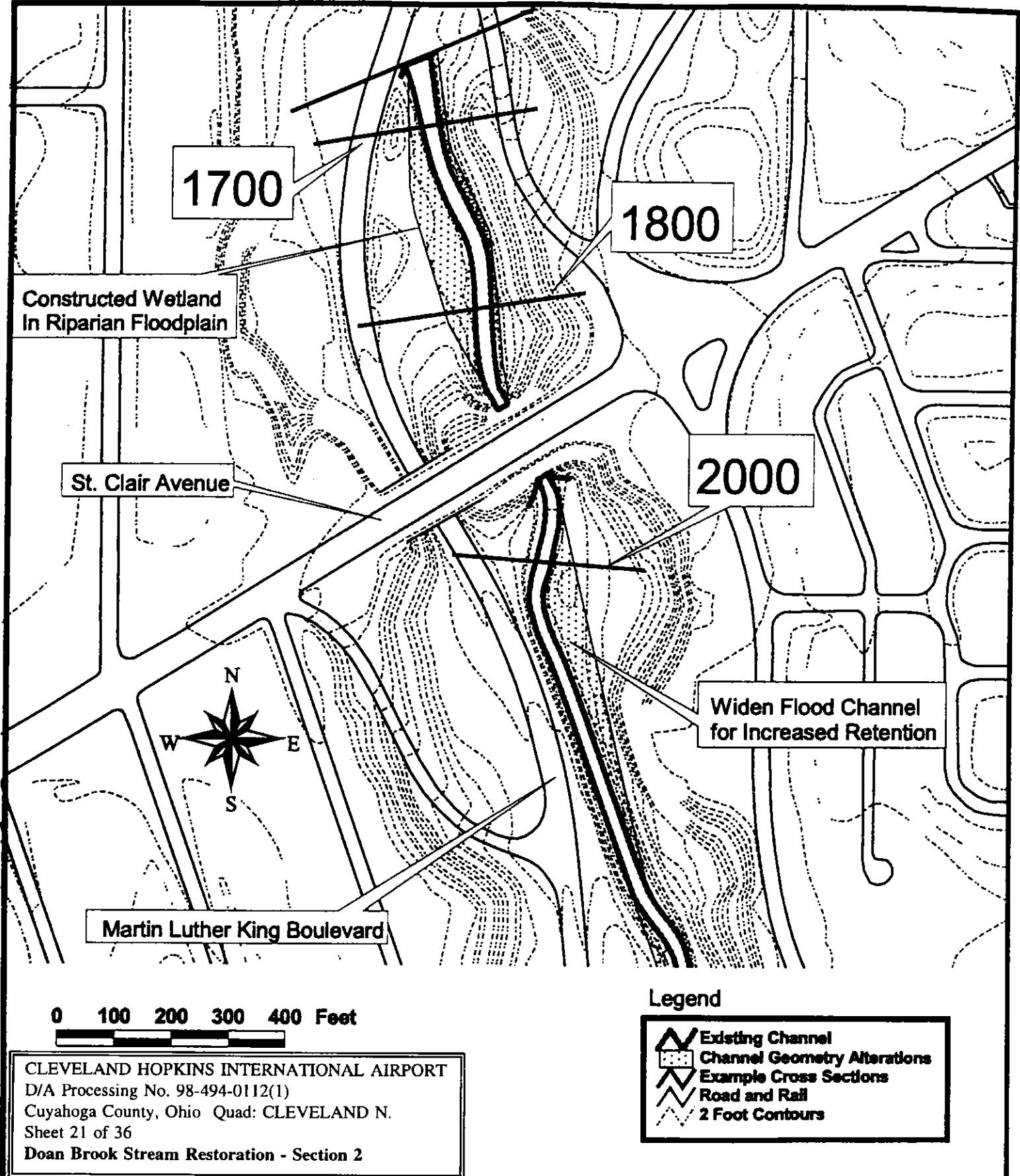
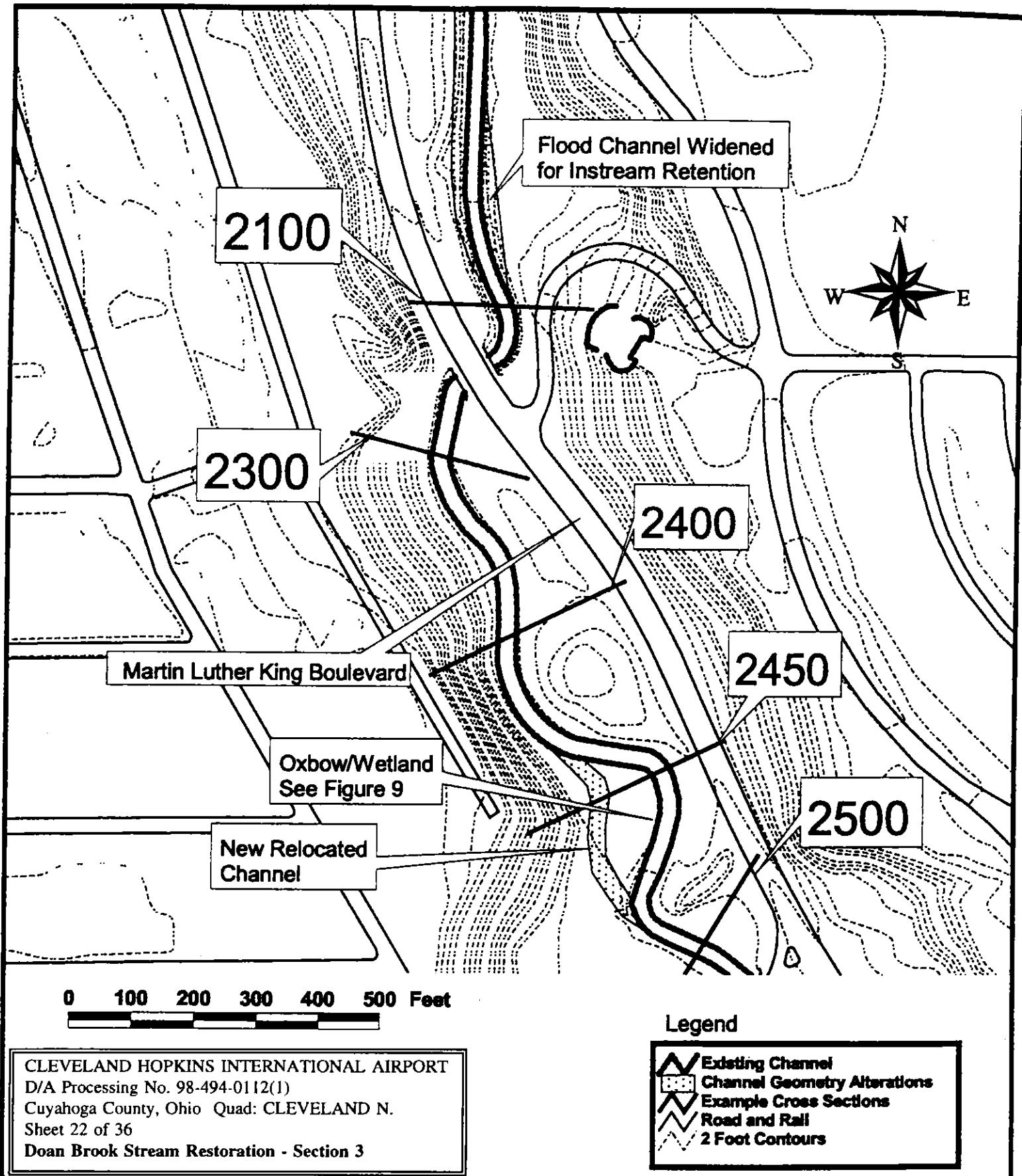


Figure 5: Downstream Culvert Inlet Detail of Existing and Proposed Improvements



**Figure 7: St. Clair Avenue Crossing
Detail of Stream Modification**



**Figure 8: Lower Cultural Gardens
Detail of Stream Modification**

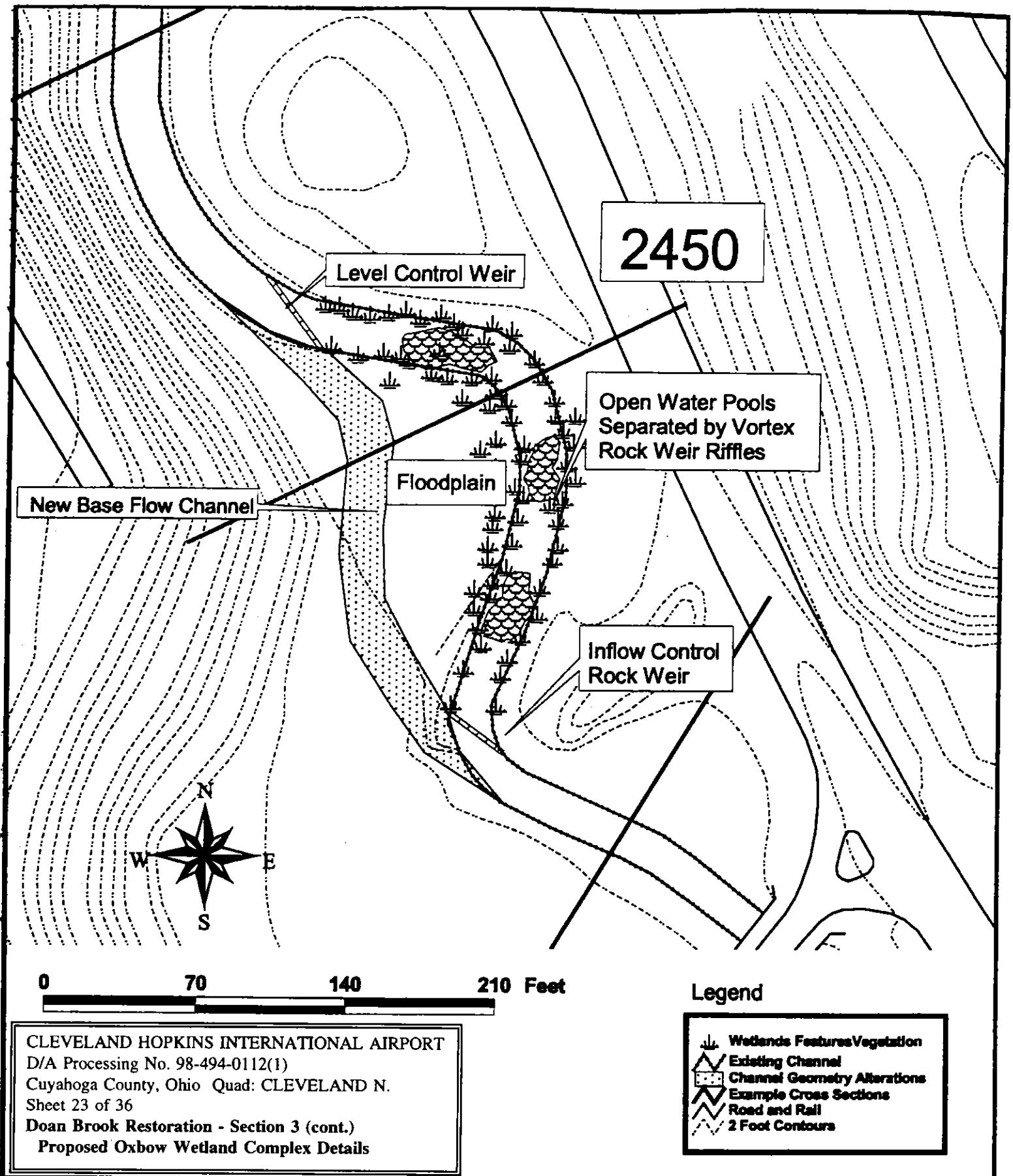
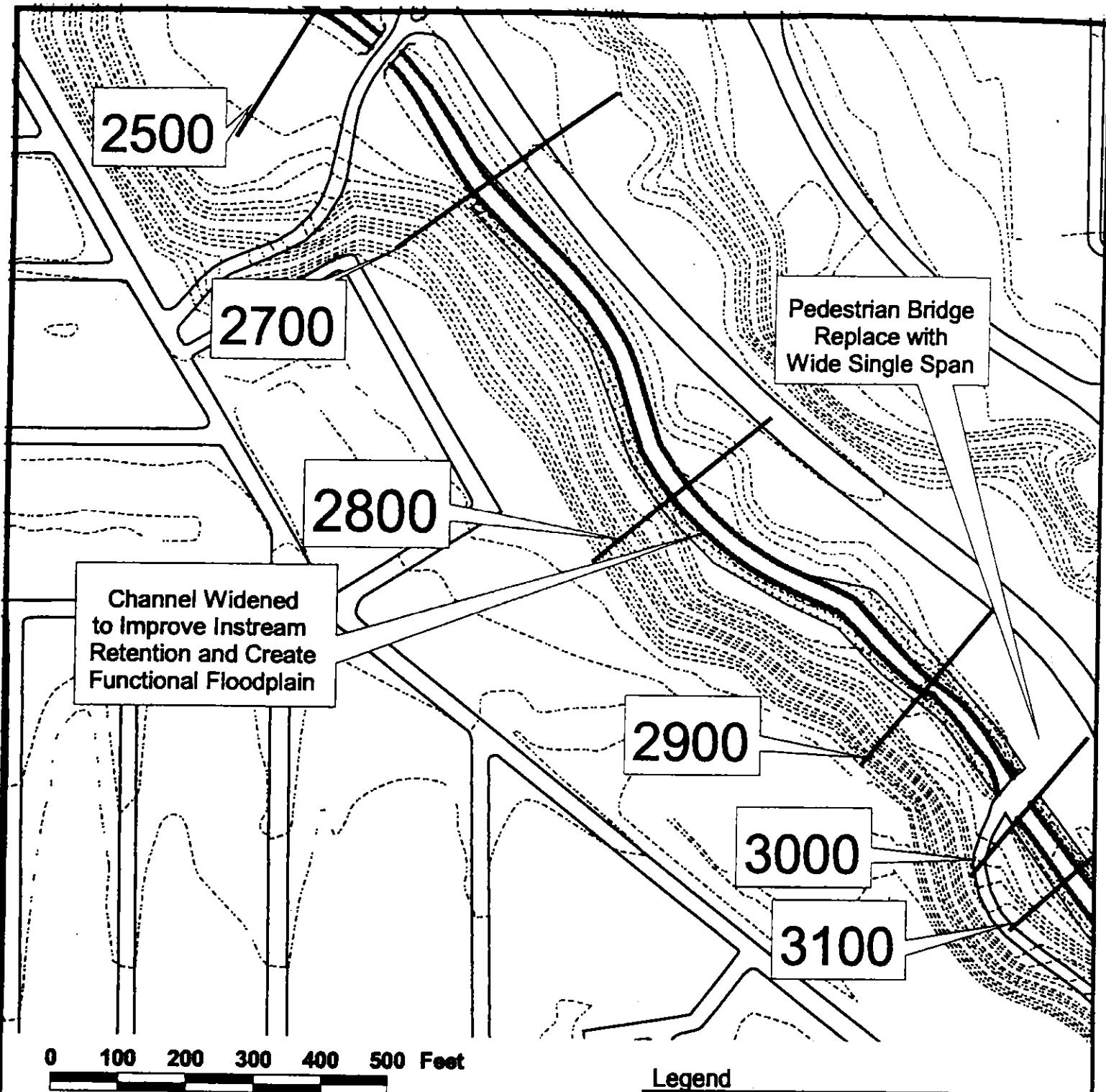
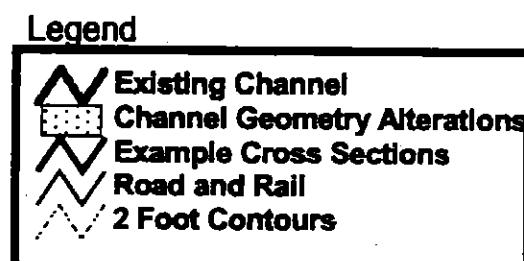


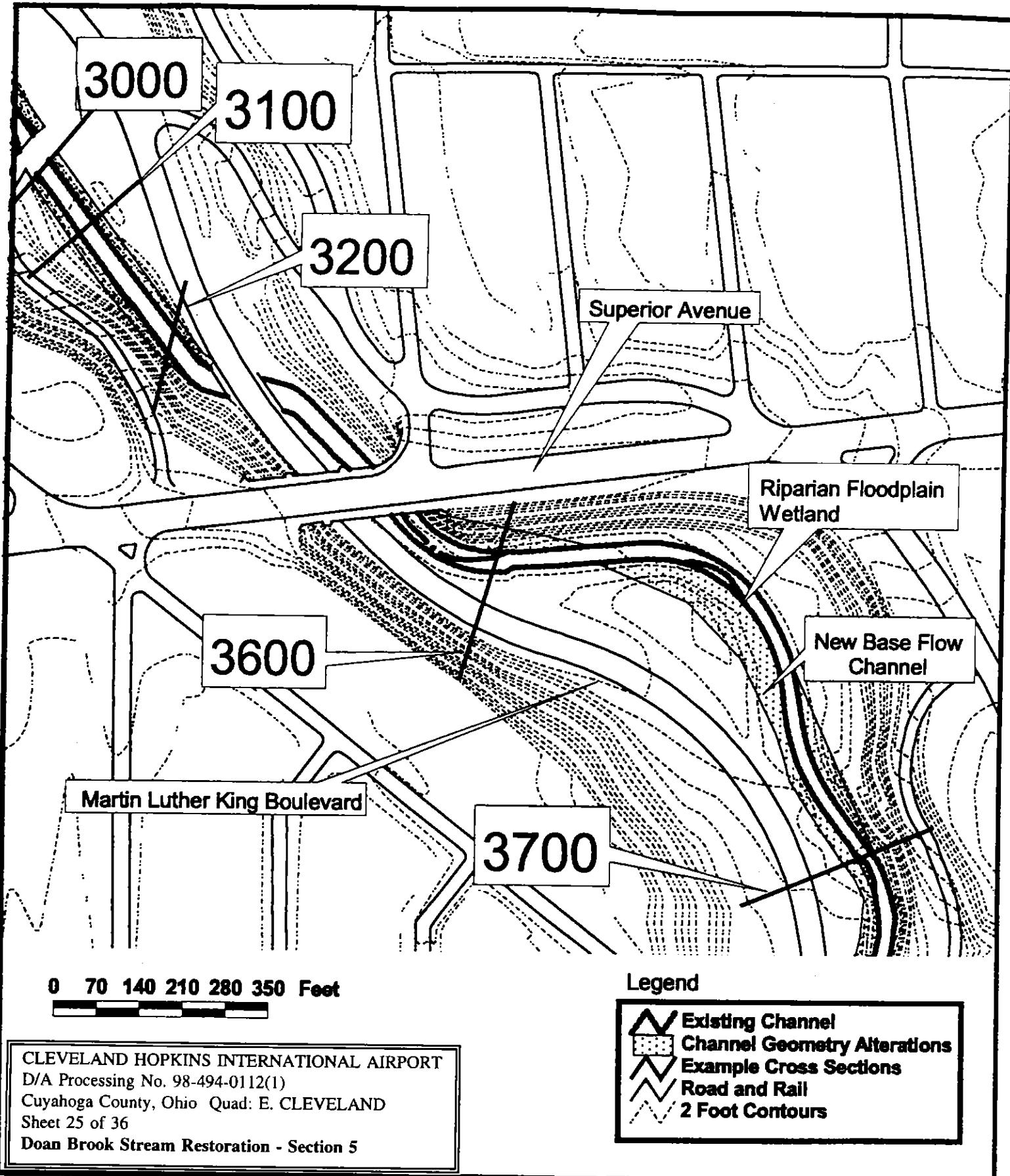
Figure 9: Detail of Proposed Oxbow Wetland Complex at section 2450



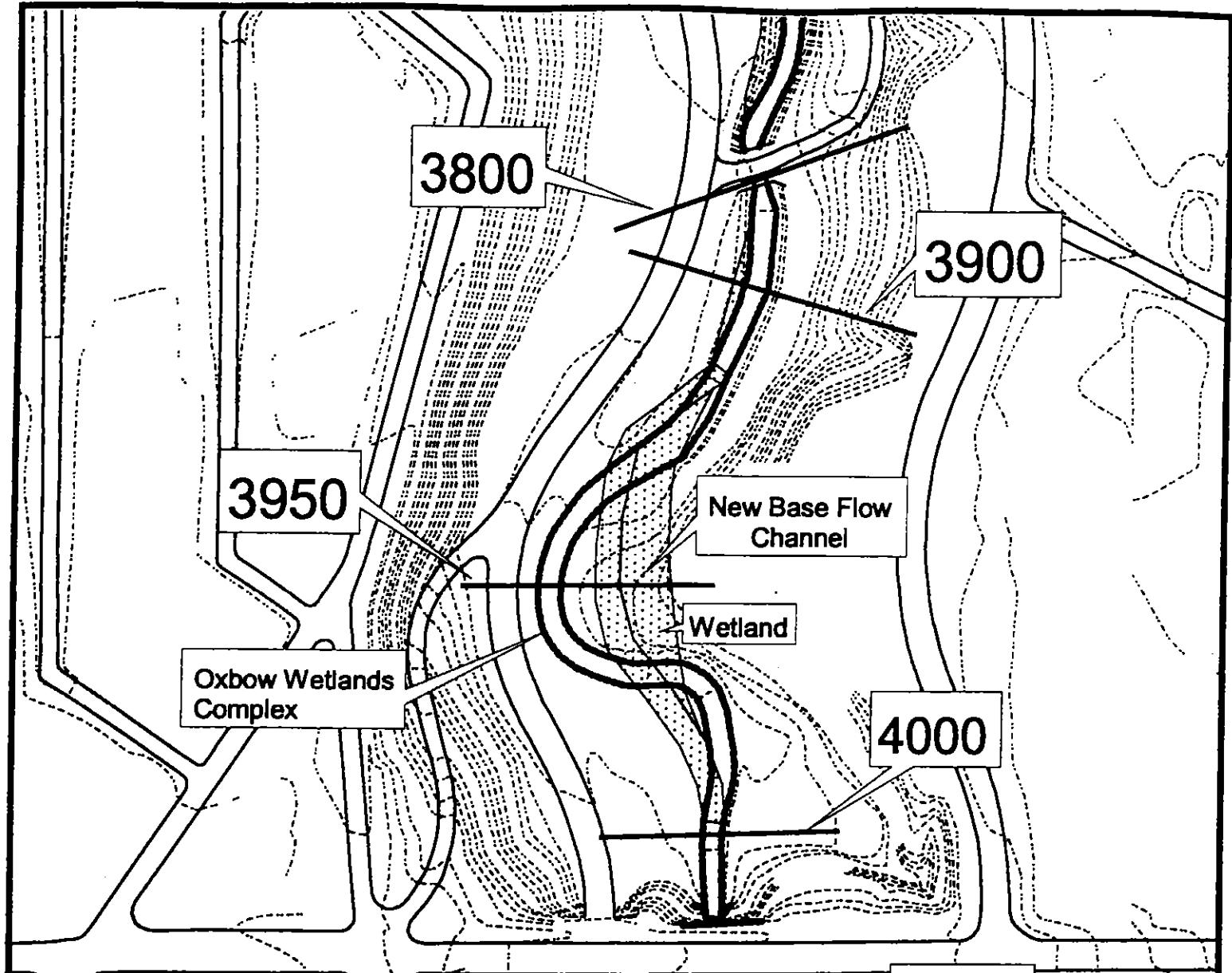
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**Figure 10: Upstream Cultural Gardens Area
Detail of Existing and Proposed Improvements**



**Figure 12 Superior Avenue Crossing
Detail of Existing and Proposed Improvements**



0 70 140 210 280 350 Feet

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Legend

- Existing Channel
- Channel Geometry Alterations
- Example Cross Sections
- Road and Rail
- 2 Foot Contours

**Figure 14: Wade Park Avenue Crossing
Detail of Existing and Proposed Improvements**

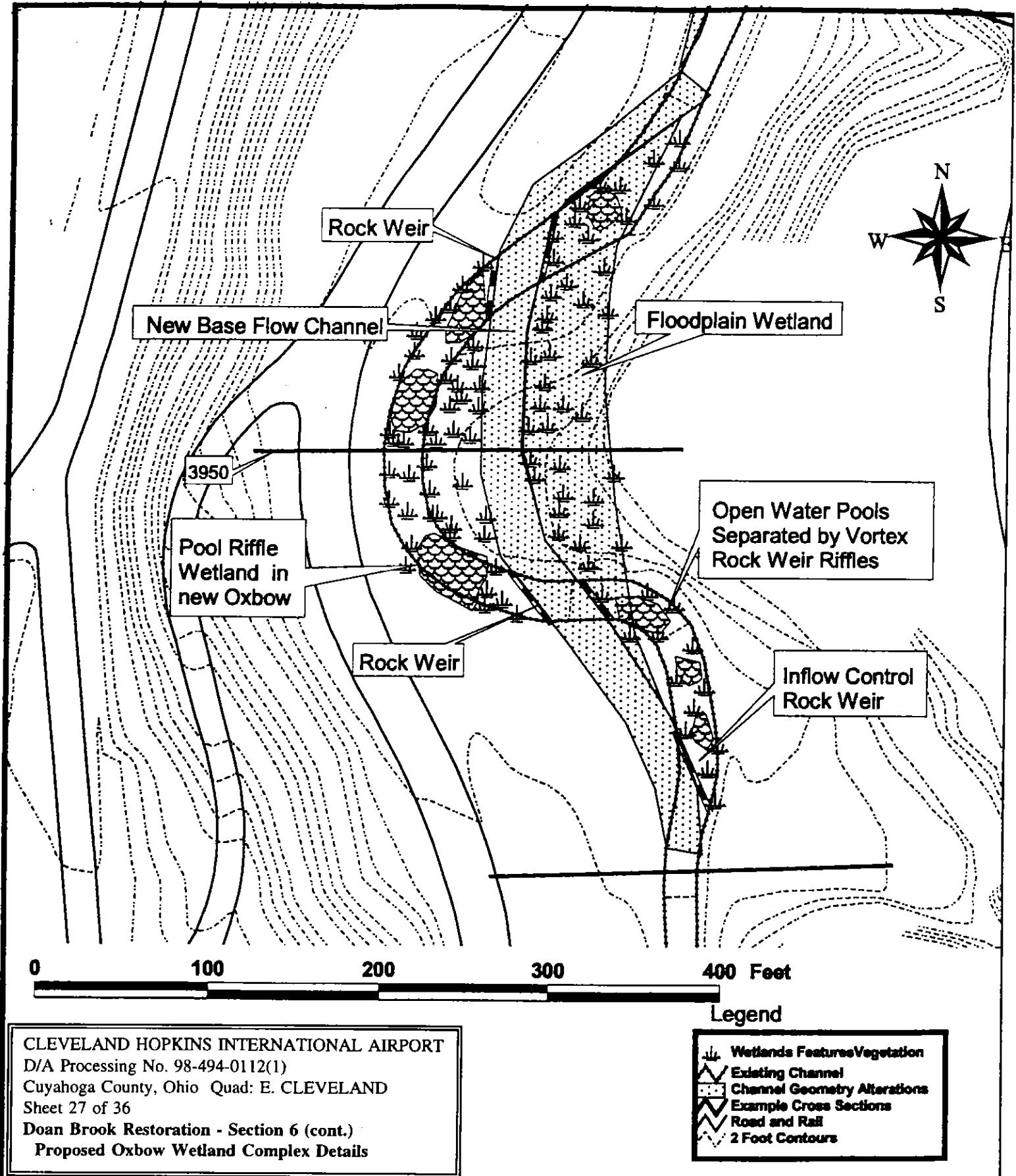
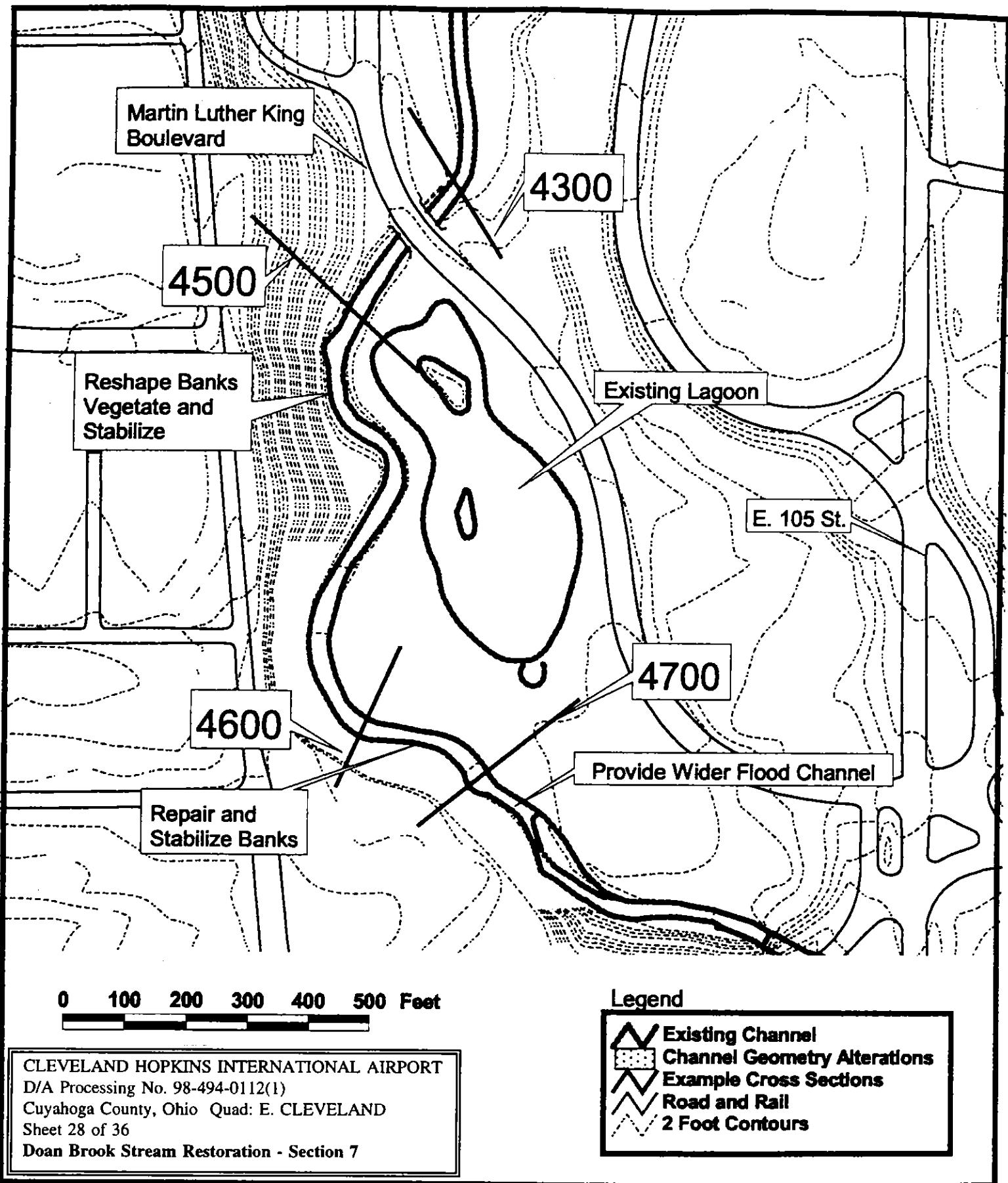
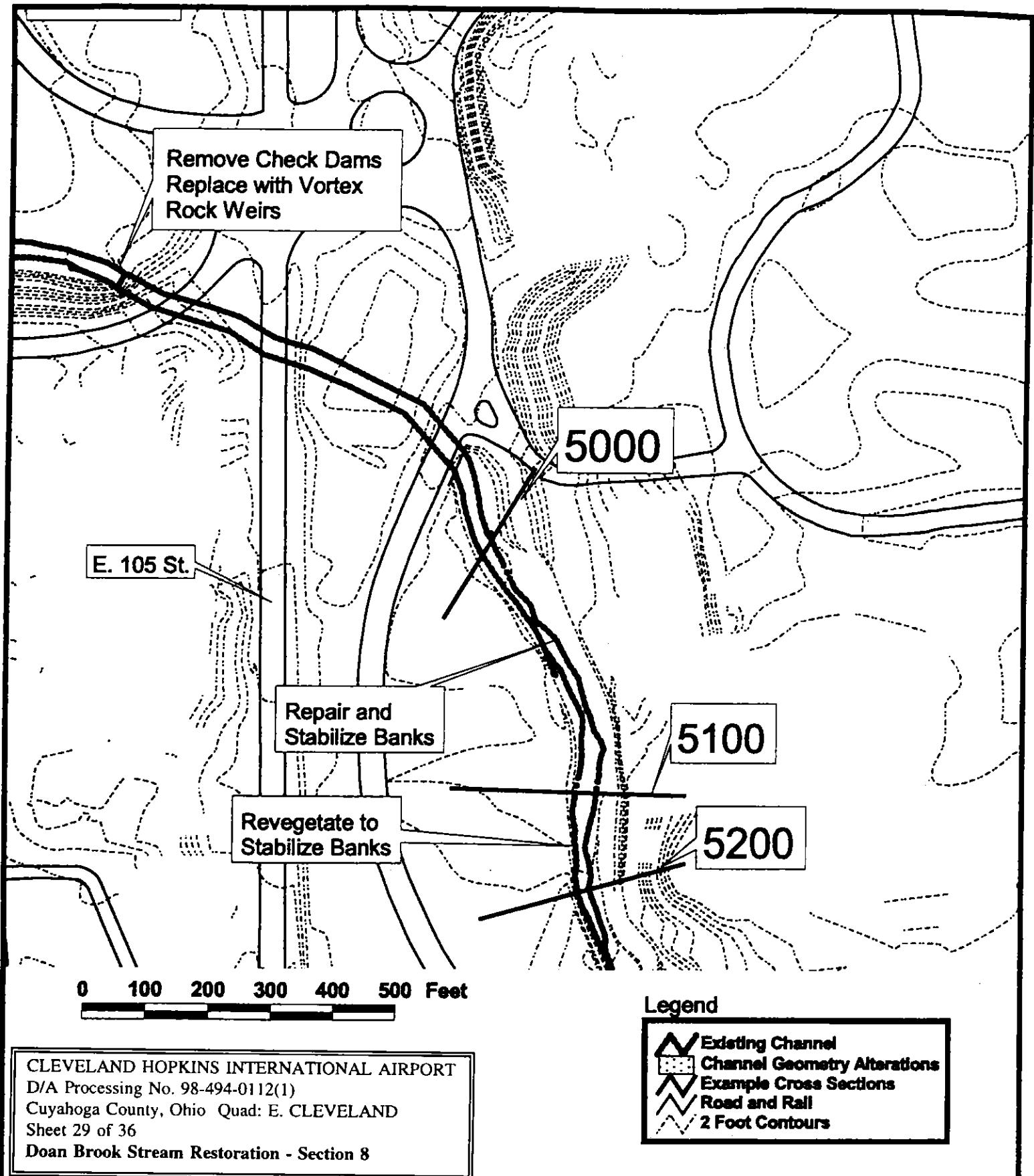


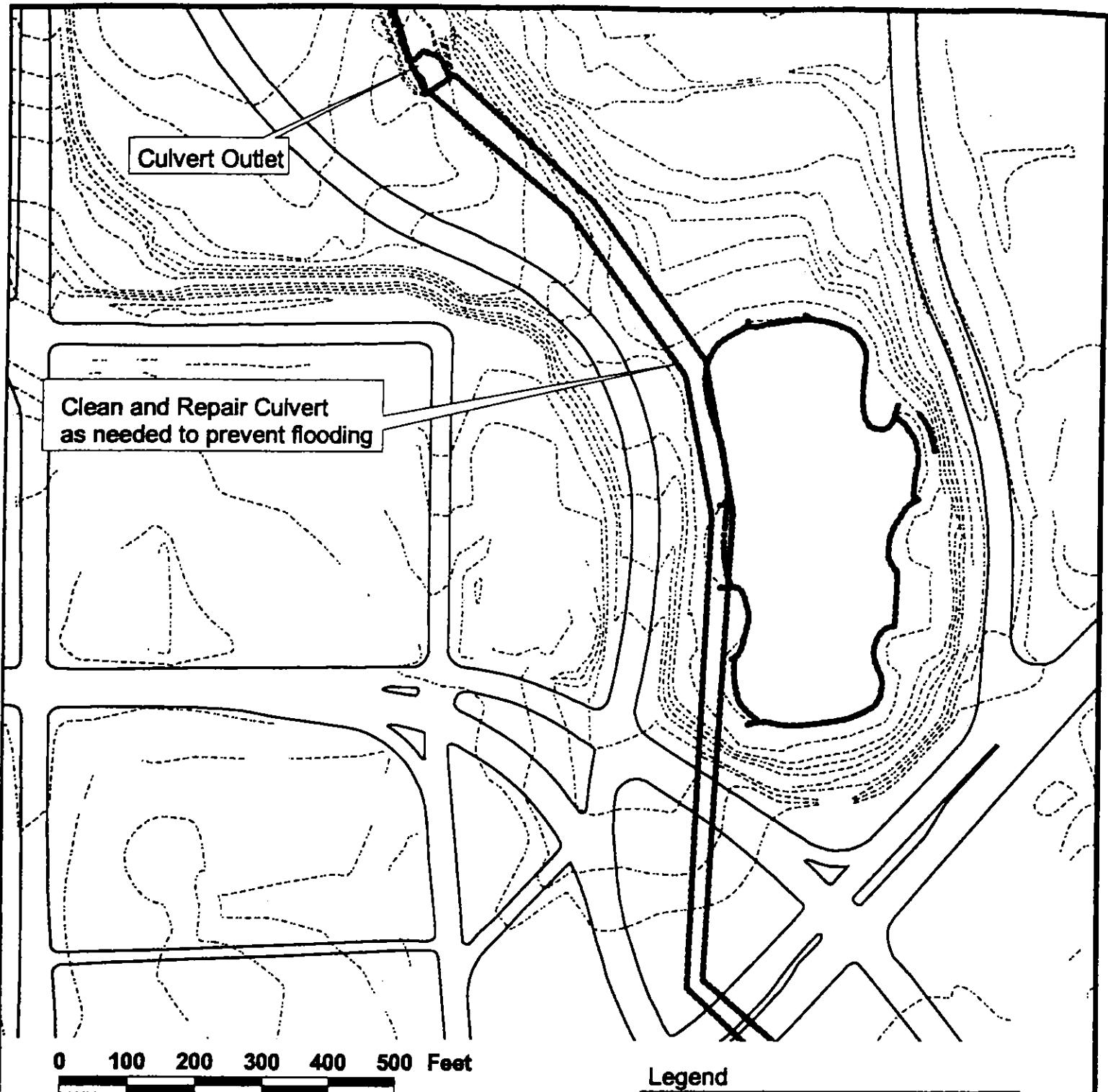
Figure 15: Detail of Proposed Oxbow Wetland Complex at section 3950



**Figure 17: Downstream of E. 105 Street
Detail of Existing and Proposed Improvements**

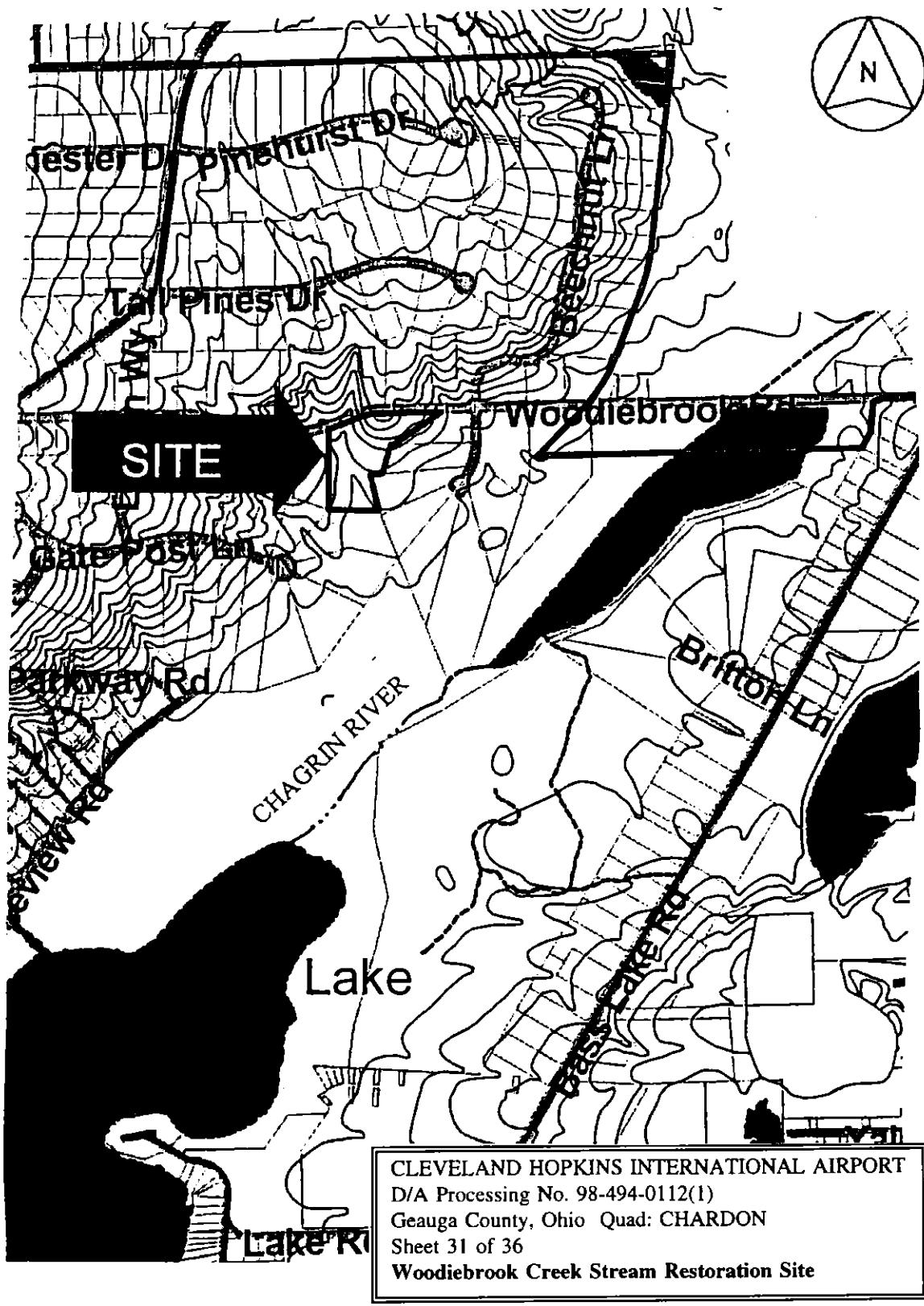


**Figure 19: Wade Park Area
Detail of Existing and Proposed Improvements**



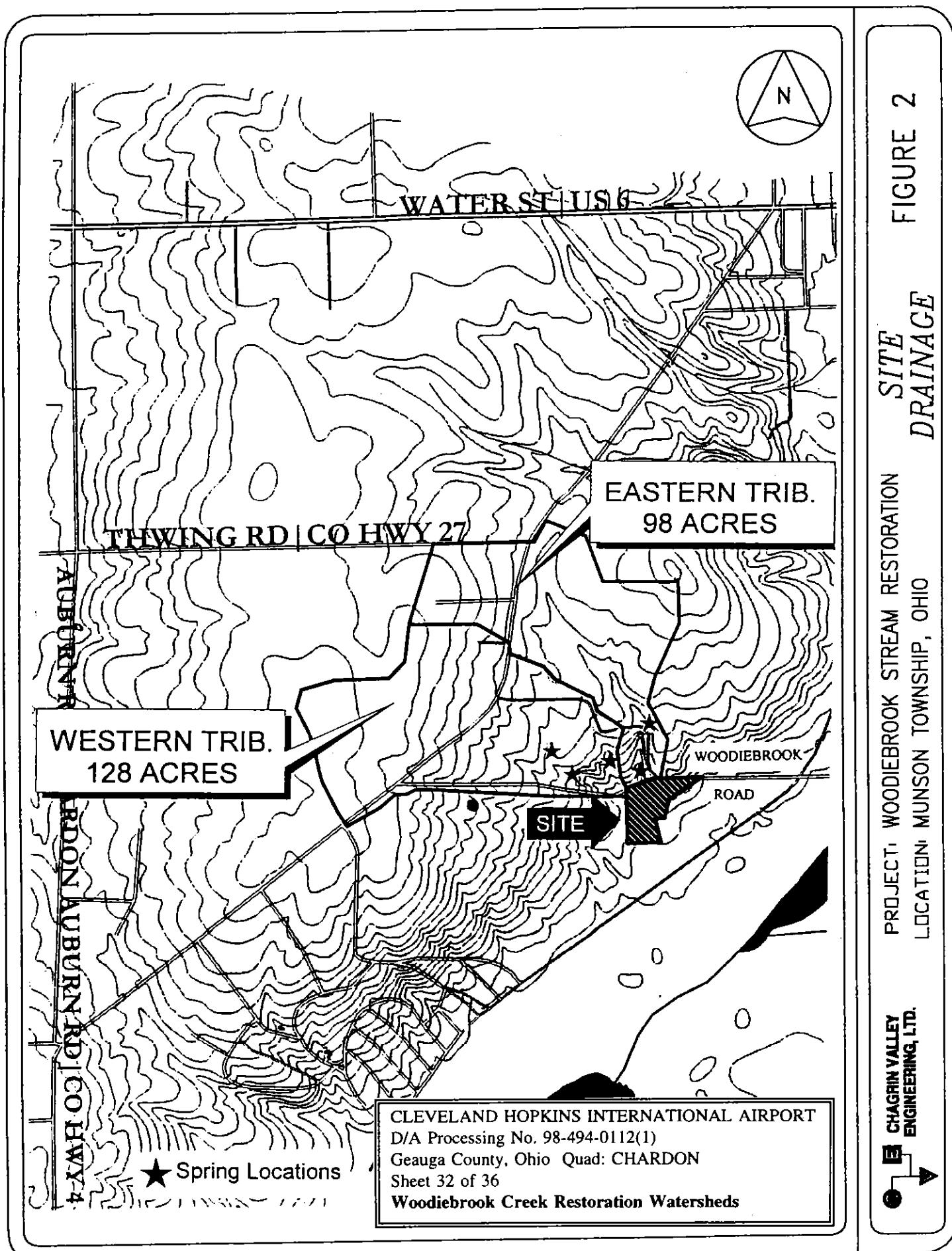
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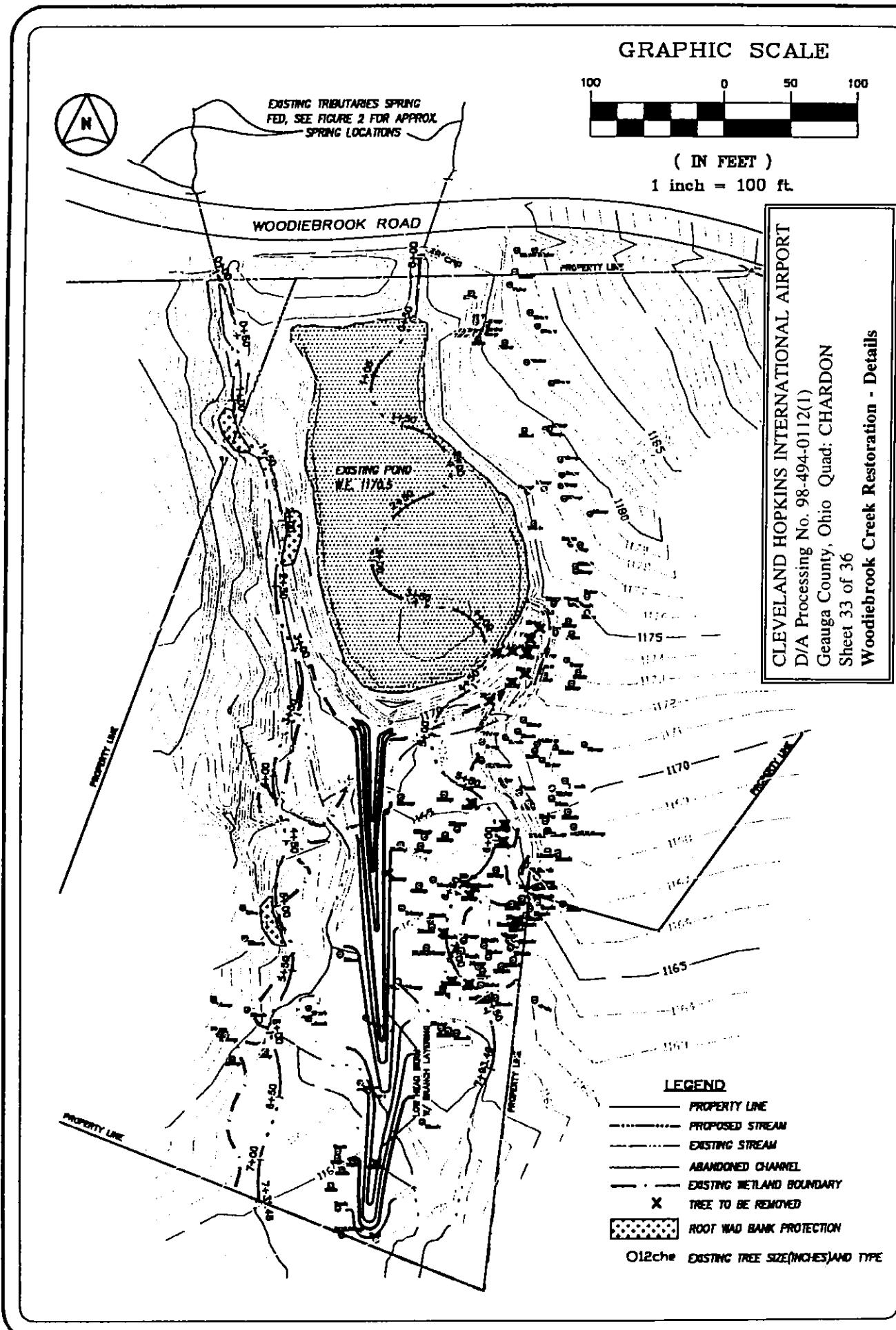
**Figure 20 Outlet of Existing Culvert
Detail of Existing and Proposed Improvements**



PROJECT: WOODIEBROOK STREAM RESTORATION U.S.G.S. MAP FIGURE 1

LOCATION: MUNSON TOWNSHIP, OHIO

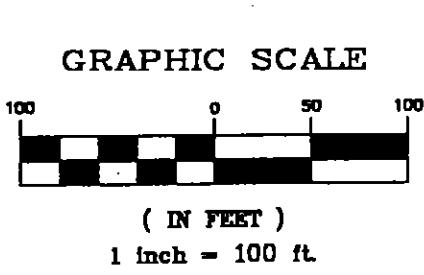
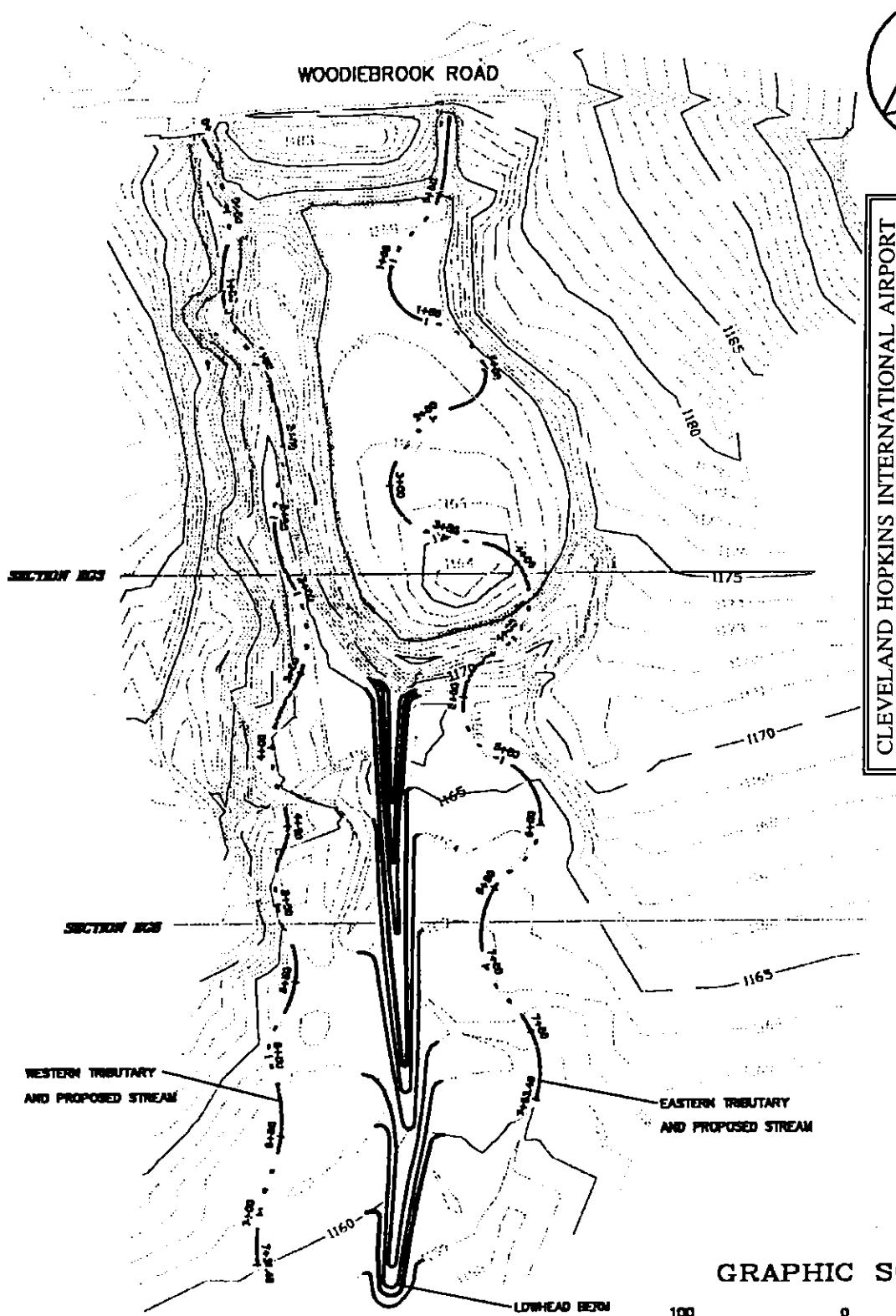




**EXIST. & PROP. FIGURE 3
CONDITIONS**

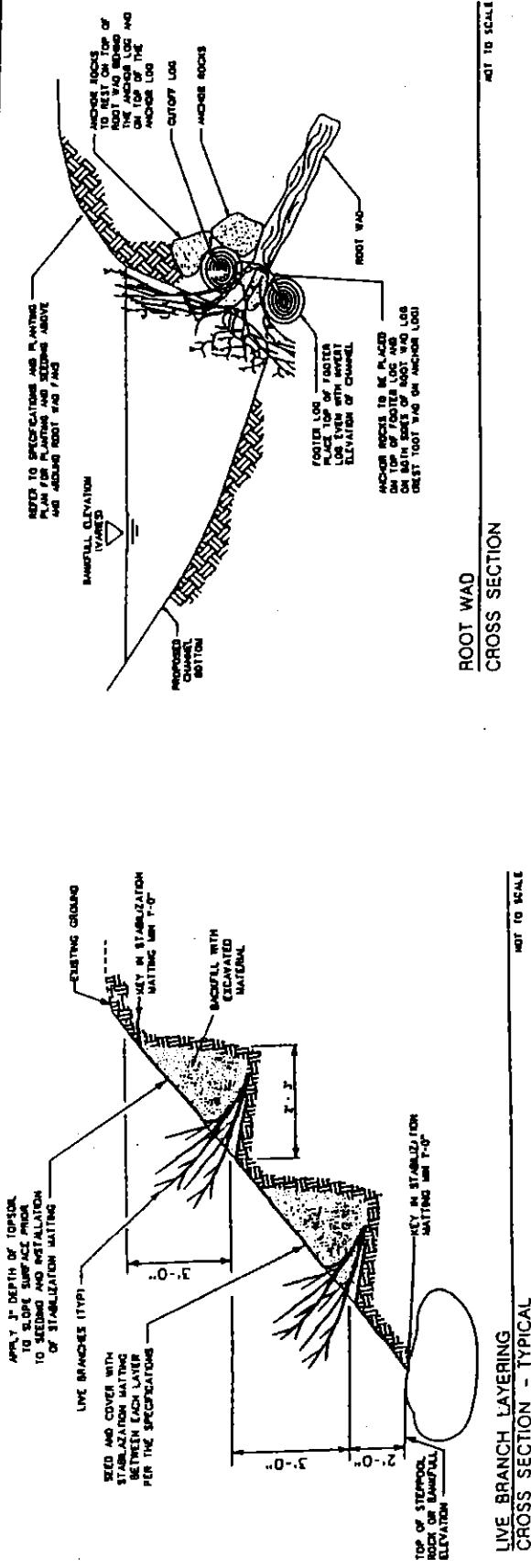
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LOCATION: CHARDON, OHIO





CHAGRIN VALLEY
ENGINEERING, LTD.
LOCATION: CHARDON, OHIO

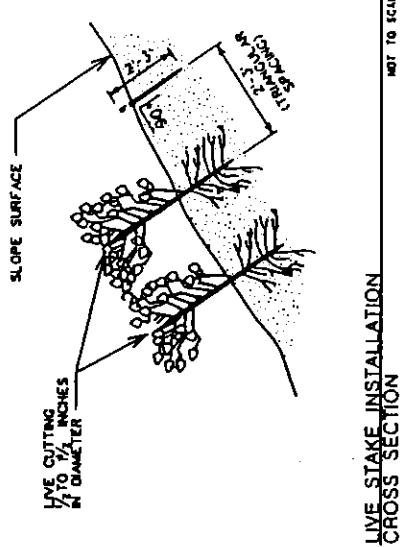
PROP. SECTIONS & PROFILES
FIGURE 5



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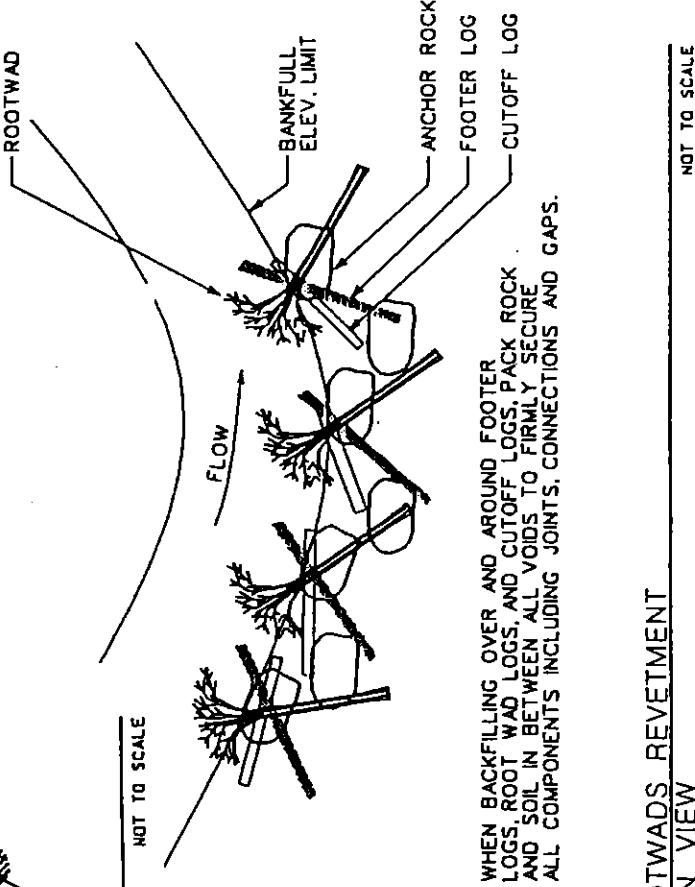
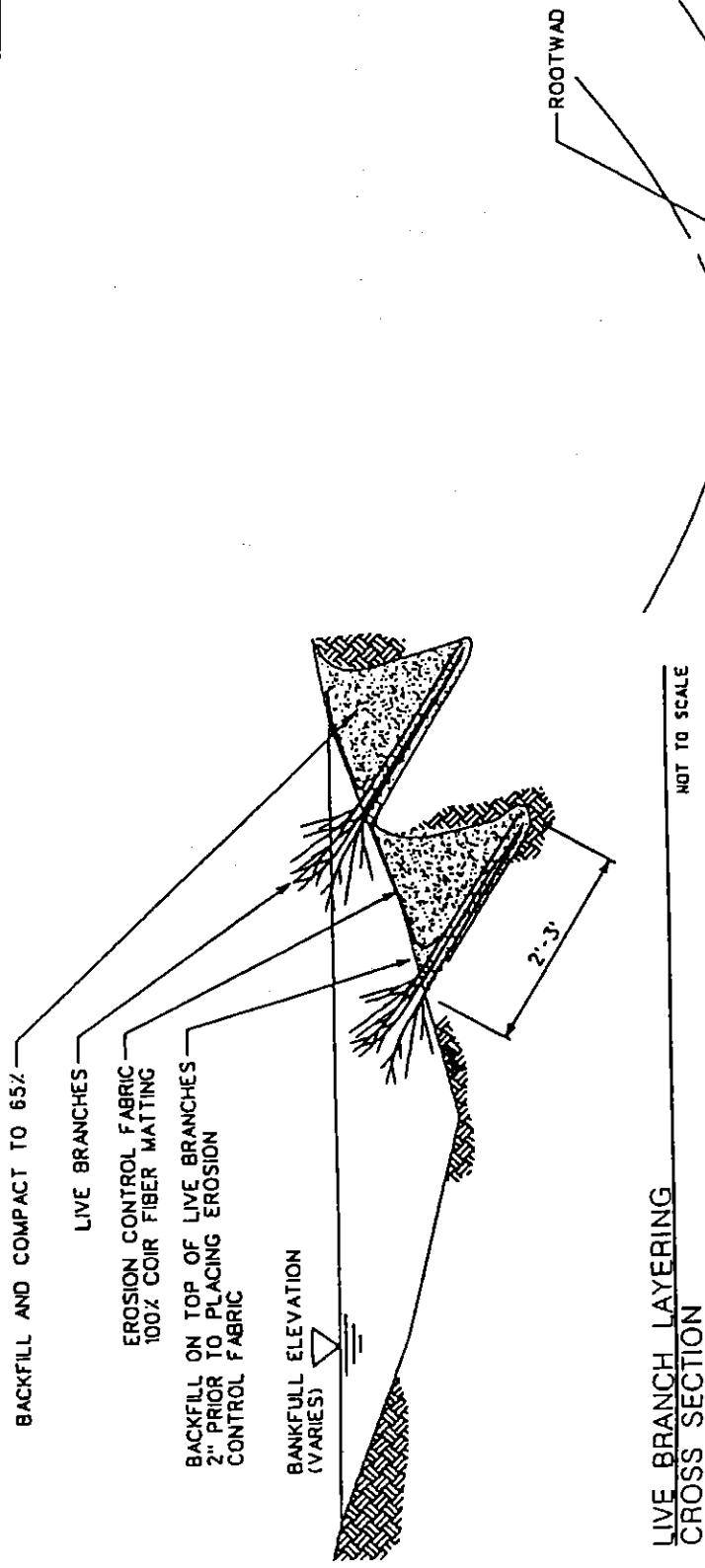
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PROJECT: WOODIEBROOK S
LOCATION: CHARDON, OHIO

bioengineering
techniques





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ROOTWADS REVETMENT
PLAN VIEW

NOT TO SCALE

 CHAGRIN VALLEY
ENGINEERING, LTD.
LOCATION: CHARDON, OHIO

**BIOENGINEERING
TECHNIQUES**

PROJECT: WOODIEBROOK STREAM RESTORATION